# Manufacturers Record

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SCIENCE AND INDUSTR

## Strikes and Communism

**Although there is no positive public proof that current labor disturbances are inspired by Communists, it is certain that they are pleased by the results. This may be said with equal truth of the agents of any form of government hostile to our own.**

**The avowed objective of protecting "social gains" is dwarfed by the incalculable losses in the defense effort and general morale.**

**Labor violence must be stopped; if force is necessary, it should be used.**

**APRIL 1941**

STACKS

*Note provision in center aisle for later installation of traveling crane* — *Factories by Ferguson*

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**MANUFACTURERS RECORD**

**Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset**

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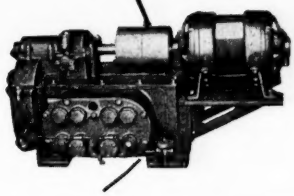

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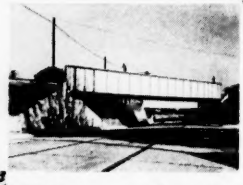

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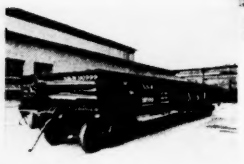
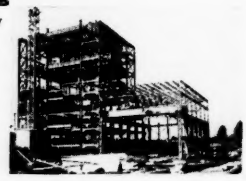
Sugar Bowl Stadium—New Orleans, La.



55-ton gondola car—N&W Rwy. Co.



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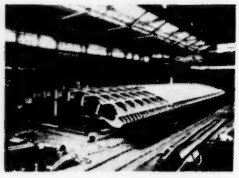

Mitre Lock Gate — Santee Cooper Project, South Carolina

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**Roanoke Birmingham Memphis New York Atlanta Dallas**

**UNITED STATES STEEL**

# THE PRINCIPAL CAUSE OF DELAYS IN DEFENSE

Labor has been riding high of late with the encouragement of the politically-minded Washington administration, but apparently labor cannot stand prosperity.

For years labor leaders have made the mistake of using the voting power of their membership as a club. They have had pretty much their own way in the passage of laws, such as the Wagner Labor Relations Act and others that have bred discord instead of harmony in employer-employe relationship. They have had the assistance of the Secretary of Labor and the favor of a previous labor relations board that saw no side to any controversy but the employes' side.

Be that as it may, things have gone too far. Essential industries working on vital defense orders have been held up on the flimsiest excuses. Matters got so acute at Dayton, Ohio, that the War Department had to step in and refuse to permit the continued stoppage of work because 400 men were unwilling to work with four men of a rival union.

The steel industry, which signed with the CIO sometime ago, is now told that a new agreement will have to be made or there will be trouble.

At Fort Meade and other army camps labor costs are passing all estimates, while the man at the gate collects from $50 to $250 from an applicant for work before he is permitted to do his part in a rush program to house the thousands of draftees. He is not held up with questions about his craftsmanship; he is stopped to find out if he is a member of a union, and if he is not he may not go to work until he pays an exhorbitant price for initiation.

The boys who went to the trenches in the last war had a lot to say when they got back about the strikes that went on in their absence. They faced death at a dollar a day, while the members of their union at home were asking and getting higher and higher wages.

As this is written, the press carries accounts of outrages perpetrated by CIO rioters at the Rouge plant of the Ford Motor Company. Other serious outbreaks occurred at Allis-Chalmers and Bethlehem Steel. Lawlessness is rampant. Valuable property has been wrecked, men injured and defense work has been seriously stopped.

In spite of the seriousness of the situation and its effect on national preparedness, no definite position has been taken by official Washington. Instead, Mrs. Roosevelt, who sometimes appears to anticipate the Administration stand on public matters, is quoted as saying she does not think strikes at this time are a question of patriotism, since we are not in a state of war.

As we have said elsewhere in this issue, the lawless type of strike witnessed at Bethlehem, Dearborn and Milwaukee must be stopped—by force if necessary.

# Construction Contracts Reach High for Year as War Effort Continues

*Two big hydroelectric projects in the southeast, as well as new fabricating facilities at the Alcoa, Tenn., operations of Aluminum Company of America, are now being constructed under a $150,000,000 program which is expected to raise the company's yearly ingot production to over 700,000,000 pounds by July of 1942. The Dick's Creek portal at the Nantahala Power & Light Co., (Aluminum Company subsidiary) hydro-electric project is shown above.*

*by*

S. A. LAUVER
*News Editor*

FEVERISH efforts of industry to cope with national defense production demands teamed with increasing Federal construction to raise the total of March contracts in the sixteen Southern States to $204,834,000, the highest monthly total for the year so far.

This peak figure is more than triple the estimate placed on contracts let in the comparable month of last year's first quarter, when the value of Southern contracts was barely more than a third of the current three-month aggregate of $542,431,000.

The $118,568,000 total of March industrial construction contracts was slightly over fifty-eight per cent of the month's contract valuation. Industrial contracts represented almost sixty-five per cent of the February total. Large portions of industrial work in both months were Federally financed.

Outright Government expenditures in the field of public building, including military facilities and housing in the South during March amounted to $48,668,000, a substantial increase over the value of this type of work placed under contract during February.

Engineering expenditures, which also are mostly financed by one Government agency or another, rose precipitously to $16,212,000. Dams, the biggest of which was the North Fork project in Arkansas, dredging and airports accounted for the major part of the increment; sewer and water work for the balance. Rural electrification activities remained comparatively stable.

Southern highway and bridge contracts dropped from the $11,520,000 of the month before to $10,899,000 in March, in face of continuing discussions of traffic difficulties encountered in communities where newly established or greatly enlarged military posts are located, or where industrial operations have expanded far beyond accessible highway capacities. It is expected that Congress will appropriate large sums to remedy these conditions.

Industrial developments, both in the formative and active stages were spread over widely separated sections of the sixteen States of the South. In the coastal regions shipbuilding expansion flourished. At inland centers aircraft plants were either being started or finished. New military and naval projects were proposed at many points, one of the proposals being a $4,500,000 expenditure for rehabilitation of the first World War port of embarkation at Charleston, S. C.

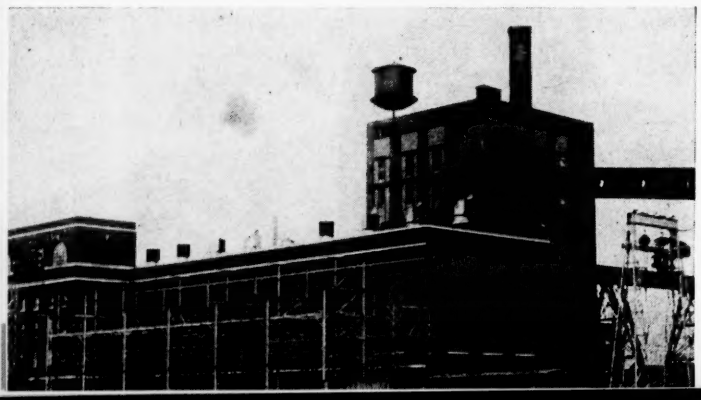
Awards for new bomber plants contributed heavily to the March industrial total. These were supplementary to such privately initiated projects as the $24,000,000 Glenn L. Martin program well under way at Baltimore; the $7,000,000 North American Aviation plant being dedicated April 7 at Grand Prairie, near Dallas, Texas, and the major Vultee Aircraft plant expansion at Nashville, Tenn.

The new bomber assembly plants are being located at Kansas City, Mo., Fort Worth, Texas, and Tulsa, Okla. Bombers of Consolidated design are to be produced at the latter two plants, the one to be operated by Consolidated Aircraft Corp. and the other by Douglas. North American Aviation, builders of the Grand Prairie plant, will operate the Kansas City factory. All are being constructed by U. S. Engineers and each is to involve expenditures of over the ten million dollar mark.

Steel manufacturers were busy during the month on preparations to establish additional units for rising national defense requirements, as construction officially was started on American Rolling Mill Company's new $5,000,000 blast furnace at Ashland, Ky., and contracts were awarded for work on a $17,000,000 steel mill on the Houston, Texas ship channel, where 1,500 workers will be required when the plant is finished at the beginning of 1942.

Rustless Iron & Steel Corp., Baltimore, prepared to embark on emergency plant facilities for Navy Department production. Cost of the work is placed at $800,000. Bethlehem Steel in the same area was working on additions under an $18,000,000 expansion program and U. S. Steel, at the plant of its Alabama subsidiary, Tennessee Coal, Iron & Railroad Co., proceeded on a similar huge project.

Increased losses of shipping as the result of intensified sea warfare accelerated preparations for additional shipyards in the South. The ace project was a 25-way, 20-building plant proposed at Jackson-



*Early summer has been set as finish date for the 40,000-kilowatt turbo-generator and new boiler being installed in the Chickasaw plant of Alabama Power Co. Spending $3,500,000 on the project, Commonwealth and Southern Corporation's Alabama subsidiary is now engaged on a $6,500,000 1941 expansion program, about one-third of which will go for completing the Chickasaw unit. Nearly $500,000 is being used for new rural lines, over $2,000,000 for rural extensions and improvements and about $300,000 for transmission line additions and improvements.*

ville, Fla., by the newly organized Jacksonville Shipbuilding Corp. The enterprise is said to outrank the famous Hogg Island operations of first World War days. The expenditure for carrying out the present plans will be between $25,000,000 and $40,000,000.

Preliminary work is under way at Baltimore on a $7,838,000 plant for Bethlehem-Fairfield Shipyard, Inc., which is to construct fifty of the Maritime Commission's standardized ships at a cost of $75,000,000. As this contract was cleared through the Office of Production Management, Houston Shipbuilding Co., at Houston, Texas, made awards for work on a $5,000,000 yard where twenty-five of the same type vessels are to be built.

Other ship construction operations are being carried out at other southern coastal points, including Wilmington, N. C., where a subsidiary of Newport News Shipbuilding and Dry Dock Co. is building a $5,000,000 plant; at Newport News, where the parent company has a $14,000,000 allocation; at Tampa, Fla., where Tampa Shipbuilding Co. is expanding, and at various Gulf Coast cities, including Alabama Dry Dock and Shipbuilding Co., Mobile; Ingalls Shipbuilding Corp., Pascagoula, Miss.; Louisiana Shipyards, Inc., New Orleans; Todd Shipyards, Galveston, Texas, and Consolidated Steel Corp., Orange, in the same State.

Simultaneously with start of manufacturing operations at the War Department's new smokeless powder plant, Radford, Va., construction was being rushed on a nearby bag loading plant and contract was let for a $9,436,816 similar plant to be erected at Childersburg, Ala., where the Army is constructing a second smokeless powder factory.

Raw materials for possible use in these explosive factories were further assured by expansion of two of the South's largest artificial silk manufacturers. Celanese Corporation of America, which not long ago started on additions to its Cumberland, Md., plant, let contract for extension of its practically new Virginia plant, where $1,500,000 is to be spent. A $1,450,000 program was begun at the viscose and acetate yarn plant of Tubize-Chatillon Corp., Rome, Ga.

Shell Oil Corp. let contract for buildings in connection with its $4,000,000 synthetic rubber plant at Houston, where the company is also building a $500,000 plant to produce toluene, T. N. T. ingredient. Other developments in the gas field included a $1,000,000 refinery for Mid-South Refining Co., Jackson, Miss.; a $1,000,000 recycling plant in northwestern Oklahoma for Magnolia Petroleum Co., of Dallas, Texas; a $2,250,000 pipeline to extend 135 miles across northern Louisiana, contract let by Southern Natural Gas Co., and a 1,261-mile pipeline proposed from the same State to North Carolina at a cost of $17,000,000 by a Standard Oil - Shell Union - Plantation Pipeline group.

Stations to furnish power for spreading Baltimore industries, as well as for operations in other parts of the South, are included in the March list of active utility projects. Consolidated Gas, Electric Light and Power Co., Baltimore, started foundation work on its $6,500,000 Riverside station, the third unit in a big expansion program. Kentucky and West Virginia Power Co., Ashland, Ky., is to expend $4,339,000 in eastern Kentucky power expansion and installations.

A large publicly operated generating plant was proposed by Jackson Purchase Rural Electric Cooperative, Paducah, Ky., to furnish current for the $13,000,000 anhydrous ammonia plant to be constructed at West Henderson, Ky., by Atmospheric Nitrogen Corp. South Carolina Gas & Electric Co. announced its intention to spend $1,000,000 on distribution lines in the Columbia, S. C. metropolitan area. Monongahala West Penn Public Service Co., Fairmont, W. Va., announced a $3,900,000 expansion for its Rivesville station.

*(Continued on page 56)*

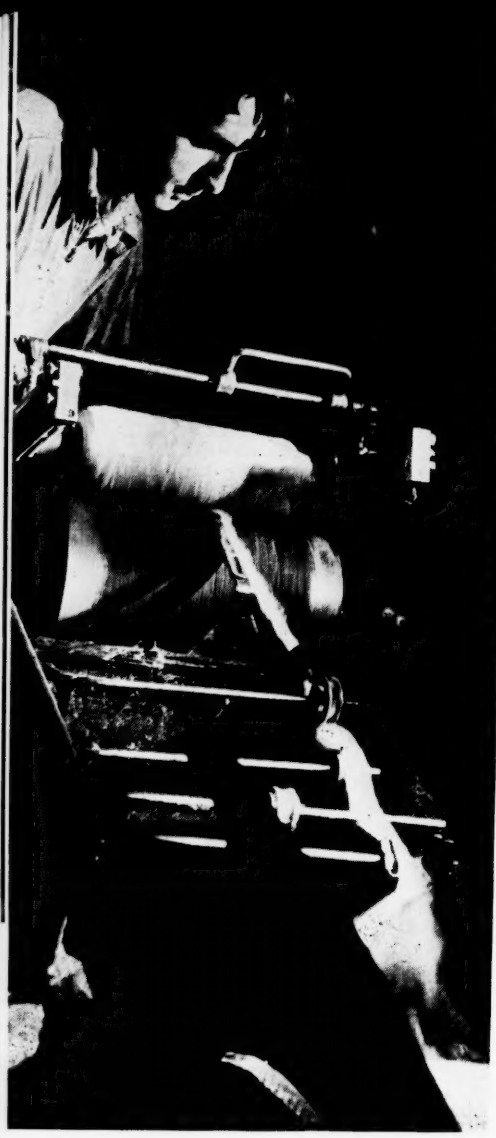
***An $8,100,000 expansion program at the Westport plant of Consolidated Gas, Electric Light and Power Co., Baltimore, is scheduled for August. 1. The photograph above shows the two new units, one of 67,000 horsepower and the other of 33,500 horsepower capacity. The present generating capacity of the company's steam plants in the Baltimore area of 300,000 horsepower will be further raised upon completion of a new $6,500,000 unit being placed under construction at Riverside. The company is also making a $250,000 addition to its engineering building.***

## Statistics of South's Construction

| | March, 1941 | | Contracts Awarded First Three Months 1941 | Contracts Awarded First Months Three 1940 |
|---|---|---|---|---|
| | Contracts Awarded | Contracts to be Awarded | | |
| **PRIVATE CONSTRUCTION BUILDING** | | | | |
| Assembly (Churches, Theatres, Auditoriums, Fraternal) | $1,738,000 | $2,276,000 | $5,301,000 | $3,170,000 |
| Commercial (Stores, Restaurants, Filling Stations, Garages, etc.) | 1,562,000 | 2,705,000 | 5,758,000 | 7,270,000 |
| Residential (Apartments, Hotels, Dwellings | 6,941,000 | 2,520,000 | 24,855,000 | 18,790,000 |
| Office | 246,000 | 175,000 | 1,180,000 | 1,606,000 |
| | $10,487,000 | $7,676,000 | $37,094,000 | $30,836,000 |
| **INDUSTRIAL** | $118,568,000 | $74,506,000 | $320,929,000 | $53,078,000 |
| **PUBLIC CONSTRUCTION BUILDING** | | | | |
| City, County, State, Federal | $25,400,000 | $52,699,000 | $86,031,000 | $23,060,000 |
| Housing | 20,296,000 | 15,219,000 | 39,019,000 | 23,886,000 |
| Schools | 2,972,000 | 3,182,000 | 6,858,000 | 4,360,000 |
| | $48,668,000 | $71,100,000 | $131,908,000 | $51,306,000 |
| **ENGINEERING** | | | | |
| Dams, Drainage, Earthwork, Airports | $12,892,000 | $55,682,000 | $15,124,000 | $11,774,000 |
| Federal, County, Municipal Electric | 1,600,000 | 40,149,000 | 5,379,000 | 7,020,000 |
| Sewers and Waterworks | 1,720,000 | 26,162,000 | 3,208,000 | 2,190,000 |
| | $16,212,000 | $121,993,000 | $23,711,000 | $20,984,000 |
| **ROADS, STREETS AND BRIDGES** | $10,899,000 | $59,960,000 | $28,789,000 | $30,610,000 |
| **TOTAL** | $204,834,000 | $335,235,000 | $542,431,000 | $186,814,000 |



XUM



# Fiberglas—A New Servant of Industry

AN airplane with "glass" wings so fire-resistant that a torch produces only a smudge on its fabric.

Electrically-heated diving suits for deep sea divers which have completely safe "glass" insulation.

These are but two of the hundreds of uses for a new material—glass in fibrous form—which is now being utilized in every basic American industry and which is adding to the comfort of millions of people. This new material is known as fiberglas.

Fiberglas material will not burn because it is made of pure glass and therefore is inorganic. The material will last indefinitely. It will not conduct electricity. It will not shrnk or rot. The manufacturers of hundreds of different important products, therefore, have found fiberglas to be an indispensable material.

In filters, fiberglas has been a boon to the air-conditioning industry. In the form of glass wool, it has improved the quality of household electrical equipment like refrigerators, hot water heaters, roasters and ranges. It is being used as thermal insulation and has developed a wide market in the building insulation field. In the form of textiles it is being used extensively as electrical insulation material.

* * *

Glass is one of the most interesting of the products which have been developed into new forms in the past decade. It has always been an important factor in man's daily life but now, in its new forms, it has become man's indispensable servant.

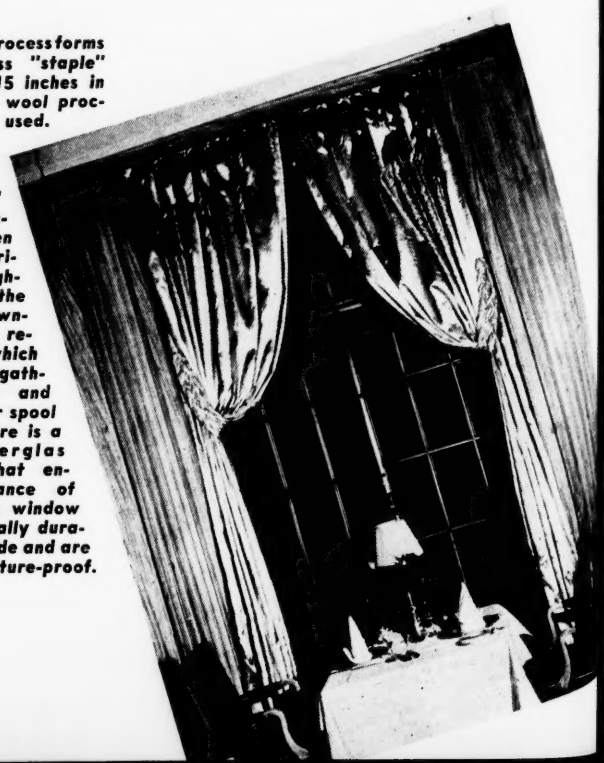
Before 1930, glass had been most familiarly known to the public as a transparent, hard, unbendable substance. Today, glass is actually being made into thread-like, bendable fibers which can be 15 times finer than human hair and yet be as strong as steel. It is also being made into a form that looks like a fleecy soft wool.

For centuries, men have dreamed of transforming glass into some form that was flexible, instead of flat and brittle. Many attempts were made but the first commercially practical method was discovered by Games Slayter, now Vice-President and Director of Research of the Owens-Corning Fiberglas Corporation, Newark, Ohio. With his staff of scientists and mechanics, Mr. Slayter succeeded in drawing glass into fibers that could be woven into textiles.

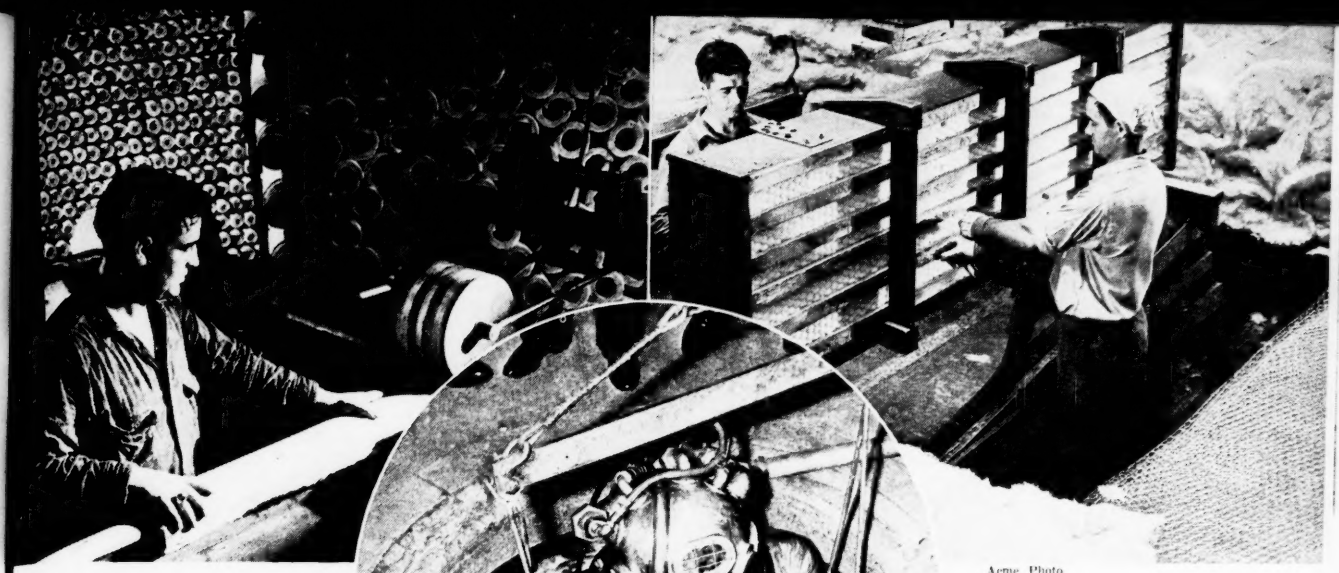
In making fiberglas textile fiber, the glass is melted and placed in a machine that molds it into small greenish marbles, each of which weighs about one-quarter of an ounce. They look like the marbles that boys play with.

These marbles are then closely examined. Any that show the slightest imperfections are thrown out. Those marbles which pass the inspection are placed in large glass containers above special electric furnaces.

The marbles are then ready to be made into fiberglas basic material. They are then melted in furnaces where the heat is roughly twelve times hotter than that needed to boil water. In the base of the furnace are tiny holes through which the molten glass flows. As the filaments of glass come down through these holes, they look like a man-made spider web.



***One Fiberglas textile process forms "staple fiber." Glass "staple" fibers average 8 to 15 inches in length and, as in the wool process, steam drawing is used. The raw material for textile production consists of pure, refined glass "marbles" which are melted electrically. The molten glass pours from orifices through a high-pressure steam jet, the fibers being driven downward onto a rapidly revolving drum from which they are immediately gathered into a roving and wound on a spindle or spool as shown above. There is a richness about Fiberglas draperies (right) that enhances the appearance of home interiors. As a window dressing they are usually durable as they will not fade and are fire-proof and moisture-proof.***



Acme Photo

***Left — By using suitable binding agents, Fiberglas insulating wool is formed on mandrels to produce light-weight and easily handled pipe insulation in a variety of forms for temperatures ranging from below zero to approximately 1100° F. Right—Individual Fiberglas fibers are springy; the mass remains fleecy unless compressed and held down. This property permits the production of any desired density of wool merely by compressing the original pack. An example of this is in manufacturing "metal mesh" blankets for insulating boilers, tanks, etc. Layers of wool are put into a jig, compressed to the desired thickness and density and then bound together with wire or cord with a facing of metal lath or wire fabric on one or both sides. Center—Niel Shahan coming out of the Navy's experimental chamber where he was under 150 foot pressure for 56 minutes. Underneath the rubber outside diving suit is the new Fiberglas undersuit which is electrically-heated. Such suits have now been approved by the Navy.***

And yet these wisp-like strands of glass—15 times as fine as a human hair—have the tensile strength of steel of corresponding diameter. In fact, they are so strong that they can be twisted and wound on spools racing at the rate of a mile a minute.

The name, "continuous filament" comes from these strands, which are almost endless. Single strands of fiberglass have been drawn more than 5,000 miles in length. The threads are so fine that from one glass marble a strand of 102 filaments nearly a mile long may be drawn.

To make a single strand of fiberglas, the filaments are drawn together. Strands are combined to form fiberglas thread. Thereafter, any form of all-glass tape, braid, cord or cloth may be produced on standard textile machinery.

A second kind of fiberglas textile uses the same glass marbles as raw material but draws the molten glass into "staple" length fibers by steam. These fibers range from 8 in. to 14 in. in average length.

Roughly speaking, the "continuous" type corresponds to silk, the "staple" type to wool. The former is sleek, the latter fuzzy. "Continuous" fiberglas can be woven into smoother, harder-finished fabrics than "staple" fiberglas, but the latter has greater bulk.

The making of fiberglas "wool" resembles, somewhat, the staple textile process. However, much larger furnaces or "tanks" are used and the marble operation is unnecessary. Raw material is mixed in batches of several tons—yet the ingredients are controlled by formulas exact to the ounce.

In this process, as in the staple textile process, the glass is caught by jets of high-pressure steam as it flows out of thin openings at the base of the furnace. The steam strikes the glass with terrific force and literally yanks it into thread-like fibers.

Here the resemblance to the staple textile operation ceases. The fibers then are conveyed to a moving belt where they form a soft, woolly blanket. This blanket, with the springy fibers intricately interlaced, is light, clean and white in color.

This "wool" is fabricated into dozens of different forms—hats, blankets, strips and nodules for insulation of ovens, boilers, tanks, stills, ducts, brine and steam pipe lines and many other domestic commercial and industrial uses.

* * *

One of the most important ways in which this new material is used is for insulation purposes. It adds to human comfort by helping keep heat inside in winter and outside in Summer.

As an air filter in heating, ventilating and air conditioning equipment, it cleans dirt and pollen from the air the heating system circulates, thus making the air more healthful to breathe and cutting down housecleaning work. It also reduces costs by increasing the period between repairing and by materially reducing merchandise spoilage.

Today, six out of every seven units manufactured by makers of heating, air-conditioning and ventilating equipment contain Fiberglas Dust-Stop air filters.

Refrigerators, ranges and water heaters work more efficiently for longer periods when they are insulated with this new glass material. Although it has been on the market for only a few years, one out of every three refrigerators manufactured in 1940 had fiberglas insulation built into it.

This new material has made possible an evolution in the design of electrical equipment. Electrical motors are being manufactured which will withstand great overloads and in which the fiberglas insulation is not affected by corrosive fumes, moisture and other difficult operating conditions. This has made possible more dependable and more permanent electrical equipment, which has saved industry many production tieups and repair costs.

Virtually all kinds of airplanes, ships and trains make use of fiberglas. As a fire-safe insulating material, it helps protect airplane pilots and passengers

(*Continued on page 56*)



XUM

# Rubber ——

*After the rubber content of the synthetic latex has coagulated, it is placed into forms where it solidifies into blocks weighing about 110 pounds. The blocks are then placed on a wash mill (shown here) where the moisture is squeezed out and impurities removed. The synthetic rubber is then sheeted into thin sheets and cut to standard size and dried.*

IN its unvulcanized state natural rubber is more or less plastic and when suitably prepared can be readily sheeted, extruded in tubular or other shapes, squeezed into the meshes of textile fabrics or spread in solution on their surfaces. These properties, important for the fabrication of articles, are possessed in varying degrees by all the synthetic materials here classified as rubbers. Vulcanization changes natural rubber from a plastic substance, soluble in hydrocarbon solvents and susceptible to marked physical and chemical alteration within the range of ordinary weather temperatures, to a new material highly elastic, insoluble (though swollen) in hydrocarbon solvents and relatively insensitive to change over a considerable temperature range. Similar changes may be induced by vulcanization in most of the synthetic rubbers.

### *Mechanism of Vulcanization*

From the column headed Unit of Polymer it is evident that all formulas except those opposite Vinyl Chloride and Isobutylene contain doubly bonded atoms. Vulcanization usually involves breakage of one bond at some of these points and either direct chemical union with a similar bond of an adjacent chain (as in the case of Neoprene) or union indirectly through a vulcanizing agent such as sulphur (as with rubber, the Bunas, Ameripols and Butyl rubbers). It is obvious why the polymers of vinyl chloride and isobutylene, which contain no double bonds, will not vulcanize in this manner. Within certain temperature limits, however, these unvulcanized synthetics manifest some of the important properties of vulcanized rubber and may logically be included in the rubber category. In soft rubber compositions cross-bonding during vulcanization occurs at relatively few points. By incorporation of large proportions of sulphur with natural rubber and vulcanizing at high temperatures for relatively long periods all of the double bonds may be reacted and hard rubber (ebonite) produced. The Bunas and Ameripols are like natural rubber in this respect but neither Neoprene nor Thiokol vulcanize to the hard rubber state. Hard rubbers of Perbunan or Ameripol are superior to that made from natural rubber in resisting flow under load at high temperatures.

### *New Synthetics Expected*

Investigations of the co-polymer field, though intensively pursued for some years past, have by no means covered all possible combinations. It is reasonable to expect that continued research may within a few years disclose several new synthetic rubbers made from as yet untried combinations, each possessing some desirable characteristic to a degree as yet unobtained. If this expectation is realized the usefulness of rubber-like materials, already extended by synthetics, will spread far beyond the limits imposed by the properties of materials now available.

### *The Properties of All Rubbers May Be Modified*

The number of uses of natural rubber unblended with other materials is decidedly limited. For one hundred years the rubber industry has been seeking improved methods of modifying rubber in order to make it more resistant to abrasive wear, oil, heat or other deteriorating materials or forces affecting serviceability. It has been necessary to produce compositions of different colors and of various degrees of hardness or rigidity—in fact, to modify all the properties exhibited by vulcanizates containing only rubber and sulphur. Such alterations are achieved by mixing with rubber before vulcanization selected kinds and amounts of other materials. These compounding ingredients are of great variety,—finely divided pigments, softeners such as oils or tars, fibrous materials, vulcanization accelerators, or age resisters. During this period in designing their products manufacturers of rubber goods have learned, also, various ways of combining the advantages of rubber compositions with desirable properties of other materials such as wood, metals or textile fabrics. Like expedients are now being followed in modifying synthetic rubbers and designing articles in which they are used. Some of the modifying materials used with natural rubber produce similar effects with synthetic, but it has been found that better results are sometimes obtained from materials not formerly adopted for rubber compounding. Just as study and experiment have disclosed ways of improving in certain respects the properties

# Natural and Synthetic, Part II

*by*

J. W. SCHADE

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*Part I of this article, which presents the latest information about rubber, appeared in the March issue of the Manufacturers Record*

of natural rubber, it is to be expected similar important improvements will be made in compounding technique with synthetics.

### Serviceability of Rubbers Constantly Improved

To meet the many requirements imposed by a wide diversity of uses hundreds of rubber compositions have been developed. For a specific service those are selected whose properties are best suited to meet the requirements. Compositions are frequently improved but, no matter how great the improvement, demands for products to withstand more severe conditions never cease. Conveyor belts, for example, originally required to carry small aggregates at ordinary temperatures, must now withstand the shock of large masses dropped upon them and, at times, must transport materials at temperatures only slightly below red heat. Belts capable of withstanding this severe punishment are now available. Such developments require the invention not only of new rubber compositions but of improved fabrics and necessitate new designs for many articles. The improvement of pneumatic tires and inner tubes is an excellent example of this response to demands for better quality and extension of the field of application. The increased wear of treads on passenger cars from 3,000 miles at slow speeds to 15,000 miles and more at the high speed of modern cars (improvement in tread wear resistance during the past ten years has averaged 10% a year), the design of tires capable of resisting temperatures of 220° F. generated in high speed bus service, the construction of tires each capable of carrying 20 tons of heavy haulage, the improvement of inner tubes so that they no longer tear to pieces when a tire is run flat after sudden deflation until the car is stopped,—all these illustrate the sort of progress made in the compounding of rubber and the design of products. The rubber industry has not been static and there is no indication that the limit of improvement will soon be reached.

### Rubber Articles Are Assembled Before They Are Vulcanized

Rubber differs from many materials in that, with few exceptions, vulcanized rubber is not sold in sheets, tubes or other standard forms to be cut to size or shape to serve as unit parts for fabrication of structures, machines or apparatus. A transmission belt, for example, is not made by plying together sheets of vulcanized rubber and lengths of cotton duck and cementing the various parts together nor are vibration dampeners made by cementing or riveting a block of rubber between appropriately shaped steel plates. The various parts of rubber articles are assembled before the rubber is vulcanized and these are welded together during the vulcanization process which develops the desirable properties of the rubber portions.

### Rubber Compositions Are of Great Variety

Inasmuch as all rubbers are greatly modified by compounding and their compositions are usually combined with other structural materials to render the rubbers useful for a great variety of services, it is evident that no table of properties can be compiled representative of any vulcanized rubber as a specific material. Values for load deflection relations, tensile strength and elongation at rupture, flow (hot or cold), specific gravity, thermal or electrical conductivity, thermal expansion, hardness and so on vary with each change of composition and sometimes with the degree of vulcanization. In comparing the properties of compositions of several rubbers each of which may be varied so widely one cannot be very specific. Certain general comparisons may be made, however, which will be of value to those who are interested in applications of rubbers for specific uses. Chart III tabulates the relative merits of rubber and the synthetics which have been used commercially in this country. Vistanex is omitted because its applications as a substitute for natural rubber are not important, although it is used in mixtures with natural rubber and for electrical insulation to some extent.

### Special Values of Different Rubbers

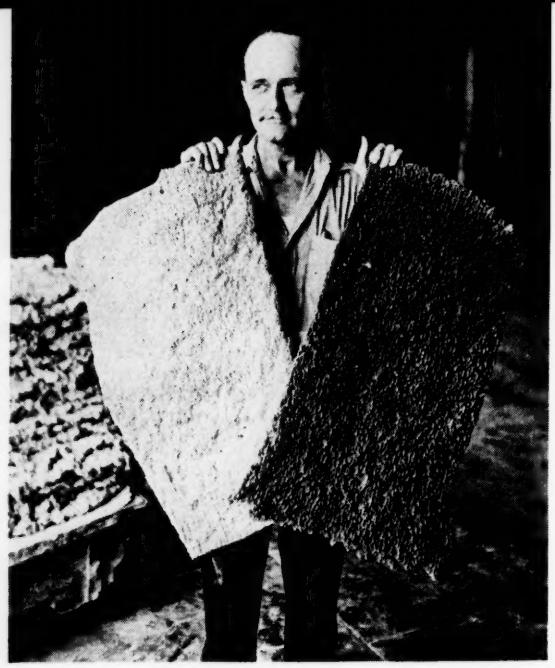
The mechanical properties of compositions of natural rubber are not surpassed to any marked extent by those of synthetic rubber stocks. For this reason, unless their cost can be reduced sufficiently to be competitive, it is probable that synthetic rubber will not replace the natural product in articles which depend for utility on such properties alone. It frequently happens, however, that in service rubber must be subjected to influences which rapidly impair its mechanical excellence. Contact with oil may be unavoidable or exposure to bright sunlight or to high temperature. In such cases compositions of synthetics or of mixtures of synthetics with natural rubber must be used. Occasionally some one material so far surpasses all others that it alone may be used successfully. For example, no synthetic has yet been found to equal natural rubber in resiliency or extensibility. Golf balls, made by winding rubber thread under tension and stationers' bands are markedly superior to similar products made of synthetic materials. Also, linings for metal tanks to resist the action of nitric-hydrofluoric acid mixtures used for pickling stainless steel or of chromic acid plating solutions are made of Koroseal because of the outstanding superiority of this material in resisting these powerful oxidizing solutions. For tubes of hose to conduct lacquer solvents and thinners Thickol is the most resistant of any of the synthetics which have yet appeared.

### Oil Resistance and Its Practical Applications

The predominant virtue of synthetics over natural rubber is their resistance to oil and organic solvents. This fact has directed their first use to those types of service where the flexibility of rubber was needed but, because of the action of such liquids, compositions of natural rubber could not be satisfactorily applied. A few of these may be mentioned by way



XUM



***Ameripol, which comes from the wash-mill in flesh-colored sheets, is changed to a light amber color by drying. Here, a workman is shown holding a sheet of dried Ameripol, at left, and dried natural rubber, at right. The rubber is washed crude No. 1 Smoked Sheet and like the Ameripol is raw or unvulcanized at this stage. The corrugated surface is imparted by the wash mill operation.***

of illustration. The superiority of rubber inking rollers on newsprint presses over the older glue-glycerine compositions indicated their possible extension to other types of printing. It was found, however, that rubber which withstood the action of newsprint inks containing no drying oils was entirely unsuited for use with inks composed of these oils containing manganese or cobalt driers. Rollers of synthetic rubbers, however, not only resist the action of oils and driers but do not soften when heated as the glue-glycerine rollers do. This has led to their adoption for a new printing process in which the ink, a solid at room temperatures, must be melted by heated rollers on the press. This is the process used in printing the new paper, PM.

Water-lubricated rubber bearings are commonly used for the outboard bearings of propeller shafts on vessels plying in silt-bearing waters. The rubber is deformed by any particles of sand which enter between it and the metal shaft and these particles travel along the shaft and are expelled without scoring the metal. In exceedingly muddy water such as is produced by the cutter heads of dredges, rubber bearings have yielded extraordinarily long service. When, however, bearings of this sort were used on vessels at Maracaibo, Venezuela, where the surface of the water was covered with a film of oil from neighboring wells the rubber swelled and softened and the bearings soon failed. Substitution in the bearings of synthetic rubber compounds which are not swollen or deteriorated by oil overcome the difficulty.

Because of their resistance to swelling in gasoline, synthetics are replacing natural rubber in hose for dispensing this fuel. Here a change in the construction of the hose has been made. The older type in which a layer of rubber was sandwiched between an inner flexible metal tube and an outer jacket of tightly woven cotton strands is being displaced by hose of conventional design in which the tube is made of a synthetic rubber composition. Similar superiority against the action of lubricating oils led to adoption of synthetics for hydraulic brake hose for use with fluids containing mineral oil though natural rubber has proved adequate for use with fluids of the glycerol type.

It should be noted that different grades of gasoline and lubricating oils affect synthetics differently. Gasolines containing benzol, for example, are more severe in their action than aliphatic hydrocarbons alone. Nor are all lubricating oils designated by the same S. A. E. number alike in their action[1]. Furthermore, the degree of swelling is not always indicative of the value of a compound. Some which swell but slightly become weak and inextensible in contact with oils.

### *Resistance to Sunlight*

Another superiority of certain synthetics lies in their resistance to checking in sunlight. This fact led to the adoption of Neoprene in a surface coating for rubber airplane de-icers exposed at times to bright sunlight which induced checking and cracking. Because the higher specific gravity of Neoprene would increase the weight and because it stiffens at higher temperature it was undesirable to replace rubber entirely throughout the structure. It is interesting, too, that by compounding the Neoprene with graphite, sufficient conductivity was obtained to prevent the potential of static charges built up during flight from becoming sufficiently high to cause discharge through the de-icer structure, which had often occurred before Neoprene coatings were adopted. The electrical conductivity and resistance to gasoline of compounds of synthetic rubbers has made practical their use as hose nozzles at filling stations where the flexibility and softness of rubber have long been recognized advantages over metal for this purpose.

Two other respects in which synthetics surpass natural rubber are their resistance to swelling by water, especially under heat and pressure, and their greater resistance to diffusion of gases.

### *Combined Characteristics Often Decide Choice of Materials*

In many cases no one property determines the selection of a material for service. A combination of several properties must be secured and technologists who design the various compositions must select those materials which yield the best all-round characteristics for the purpose. Good resistance to abrasion is obtainable from most of the synthetics under certain conditions of service. Shoe soles of Koroseal will outwear rubber compounds of the same hardness; but if the service were such that the material became heated as the result of friction, Koroseal would not be considered. If again, to the demand for good resistance to abrasive wear is added the requirement that the composition must withstand heating under rapidly repeated compressions natural rubber would be selected, but if oil resistance is a further requisite the technologist will abandon rubber entirely and, necessarily accepting some heat generation, pick one of the synthetics. Unfortunately, not all of the synthetics which exhibit excellent resistance to the action of oil possess satisfactory characteristics for use as electrical insulation. Of the oil resistant varieties Koroseal has found the widest use in the electrical industry as insulation or as oil-resistant sheathing on wire and cables. In these constructions, the fact that Koroseal does not require vulcanization is a decided advantage.

### *Specifications For Rubber Compounds*

In order to be certain of obtaining articles suitable for their needs purchasers of rubber goods often specify certain features of construction or composition which they believe will insure the desired qualities. With this in view some have drawn specifications designating that the compound shall be made of a particular synthetic rubber. This practice is undesirable for at least two reasons. In the first place it prevents the manufacturer from utilizing any other material even though it may furnish to the consumer goods of better quality or lower cost or both. In fact, improvement of quality, especially of articles built up of various parts, may be largely dependent on the processing properties of the synthetics,—a feature about which the consumer usually has no information. Second, it hin-

ders the commercial development of new synthetics by reducing the amount which might otherwise be used. Costs of these materials are greatly influenced by the volume of production. If a new synthetic, no matter how good, will not be accepted, its use cannot increase as it might in a free market with competition based on quality alone. The practice of specifying acceptance tests of such character as to insure suitability for the desired purpose and leaving to the manufacturer the choice of the materials from which he can best secure the necessary properties must inevitably result in the purchaser's obtaining higher quality and better value for his expenditure. No chemical manufacturer who produces synthetic rubbers is unbiased in promoting sales of his product. Even though he knows that for certain purposes a competitive material is preferable, he does not recommend its use. Technologists in rubber manufacturing establishments, on the other hand, utilize all kinds of synthetics. They are interested only in obtaining the best materials available. They are constantly making comparisons among the commercial synthetics and adopting each for specific types of service on the basis of their merits. Their experience and judgment should be of value to engineers or inventors who need to apply rubber compositions for attaining certain objectives. Specifications should permit them to choose the materials best suited to each type of service.

### Summary

The development of synthetic rubbers is a new and expanding field. Compositions of these synthetics offer no marked advantage over those of natural rubber in their mechanical properties but are far superior in resisting certain deteriorating influences often encountered in service. The earliest applications of synthetic rubbers were based on their outstanding resistance to sunlight, gasoline and oils. Occasionally some one material is satisfactory for a particular service. More often the desired results may be obtained from two or more of them. Superiority has been found in synthetics over natural rubber in:

a) Resistance to swelling and deterioration in contact with oils, organic solvents and water.

b) Resistance to cracking in sunlight.

c) Resistance to deterioration by heat.

d) Resistance to powerful oxidizing agents.

e) Resistance to diffusion of gases.

Rubber still exhibits superiority to all the synthetics now available in:

a) Elasticity and rebound.

b) Low heat generation through hysteresis.

c) Extensibility.

d) Resistance to stiffening at low temperatures.

**CHART III**

E = Excellent, G = Good, F = Fair and P = Poor

| *Property* | *Rubber* | *Neoprene* | *Thiokol* | *Koroseal* | *Perbunan* | *Oil Resistant Ameripol* |
|---|---|---|---|---|---|---|
| Abrasion and Tear Resistance | E | G | P | E—if heat is not generated | E | E |
| Adhesion to Metals | E | E | F | F | E | E |
| Aging in Storage | E | E | E | E | E | E |
| Chemical Resistance: | | | | | | |
| Oxidizing Solutions | P | P | P | E | P | P |
| Ozone | P | E | E | E | F | F |
| Solutions of Salts, Alkalies and Acids | G | G | G | G | G | G |
| Color Range | E | G | P | E | F | G |
| Resistance to Cutting | G | G | P | E | G | G |
| Resistance to Diffusion of Gases | F | G | E | E | G | G |
| Elasticity and Rebound | E | G | P | F | G | F |
| Electrical Properties: | | | | | | |
| Conductivity | F | F | F | F | F | F |
| Resistance to Corona Cracking | P | E | E | E | P | P |
| Dielectric Strength | E | F | F | E | F | F |
| Flame Resistance | P | G | P | E | P | P |
| Resistance to Flex—Cracking | G | G | F | E | G | G |
| Resistance to Flow: | | | | | | |
| Cold | E | G | P | F | E | E |
| Hot | E | F | P | P | E | E |
| Hardness Range—Durometer A | 20-100 | 10-90 | 20-80 | 10-100 | 10-100 | 10-100 |
| Low Heat Generation Through Hysteresis | E | F | F | .. | F | F |
| Freedom from Odor | G | F | P | E | F | F |
| Resistance to Swelling in: | | | | | | |
| Chlorinated or Aromatic Solvents | P | P | G | Shrinks because of extraction of plasticizer | P | F |
| Lacquer Solvents | P | P | G | | P | F |
| Mineral Oil or Gasoline | P | G | E | | G to E | E |
| Water | F | G | .. | E | E | E |
| Resistance to Deterioration by Mineral Oil | P | E | F | G | E | E |
| Specific Gravity of Basic Material | 0.93 | 1.25 | 1.35 | Ave. Plasticizer Content 1.30 | 0.98 | 1.00 |
| Range of Stretchability | E | G | F | F | G | G |
| Resistance to Checking in Sunlight | F | E | E | E | F | G |
| Stability of Properties with Change of Temperature: | | | | | | |
| Cold | E | F | E | F | G | G |
| Heat | G | E | P | P | E | E |

REFERENCES

[1]To be marketed as HYCAR rubber by the Hydrocarbon Chemical and Rubber Company.

[2]Ind. & Eng. Chem. 32, 1283-1292 (1940).

[3]Butyl rubber reported to be "a co-polymer of olefins with small amounts of diolefins" is similar to the synthetics of this class.

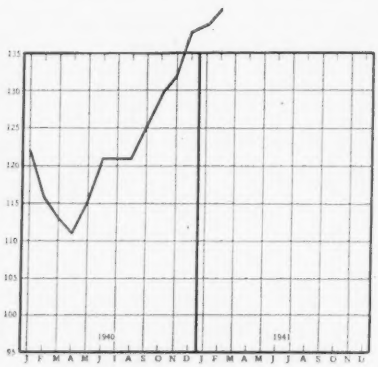
[4]Ind. & Eng. Chem. 32, 1069-1072 (1940).

[5]India Rubber World 103, No. 1, 44 (1940).

***After two weeks' immersion in oil a at constant temperature of 160 degrees Fahrenheit, a miniature tire of natural rubber swelled 40% in diameter and increased 180% in volume. The miniature tire of synthetic rubber showed no effects of its oil bath and retained its original dimensions. Dr. W. L. Semon is shown comparing two tested tires, the natural rubber at right, while an untested tire in foreground indicates size of the two test tires before their immersion in oil.***

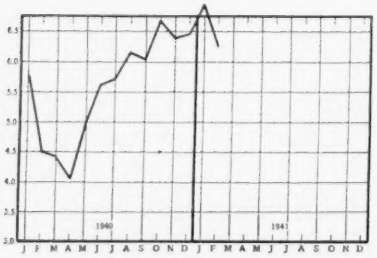
# INDUSTRIAL PRODUCTION TRENDS

INDUSTRIAL production continued its upward course during February, rising two points from January to a new high of 141 on the adjusted index 1935-39=100. This compares with 116 for February a



**INDUSTRIAL PRODUCTION**
(*Index* 1935-39=100)

year ago when a fall of six points was recorded from the previous month. Contributing to this uprise and assuring its continuation is the fact that between June 1, 1940 and January 31, 1941, 784 plants have undergone expansion for defense

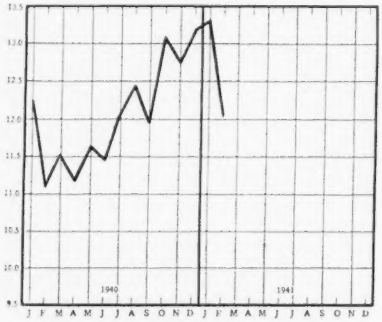


**STEEL INGOT PRODUCTION**
(*Millions short tons*)

purposes, involving an estimated cost of $2,138,000,000.

Total steel production amounted to 6,250,413 tons, compared with 6,943,084 tons in January and 4,527,141 tons in February a year ago. At that time the percent of capacity was 70, whereas in February of this year the rate was 96.8%. Although this would seem to indicate a decline from the previous month, on the basis of weekly production, the decline was less than 5,000 tons.

Cotton consumption declined slightly to 793,626 bales in February, comparing with 843,274 bales in January and 661,771 in February 1940. In spite of this decline, cotton mill activity continued at a high level and the longer month of March is

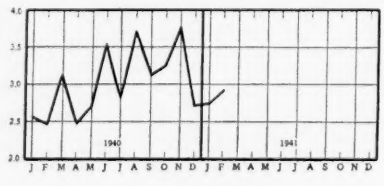


**ELECTRIC POWER PRODUCTION**
(*Billions kilowatt hours*)

likely to show a return to the high figure of January.

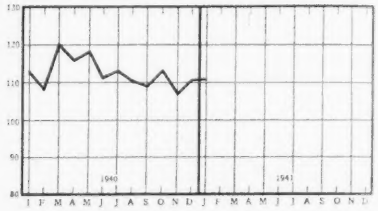
Production of electricity totaled 12,039,133,000 klowatt hours during February, representing an increase of 10.6% over the same figure of a year ago. Compared with January, there was a decline in total production but, on a daily basis, production rose 941,000 kilowatt hours per day. Production by water power during February amounted to 3,902,816,000 kilowatt hours, or 32% of the total output.

In spite of the shorter month, carloadings in February rose to 2,824,188 from 2,737,038 in January. Compared with February 1940, this year's figure registers an increase of nearly 15% over the February 1940 figure. Preliminary indications are that the March figure will be well in excess of 3,000,000 cars.



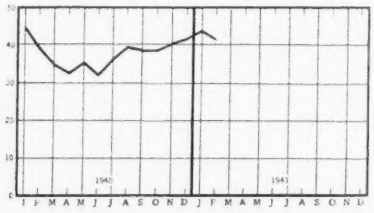
**CARLOADINGS**
(*Millions*)

Total production of petroleum in January was 110,647,000 barrels, or only 127,000 more than was produced in December,



**CRUDE PETROLEUM PRODUCTION**
(*Millions of barrels*)

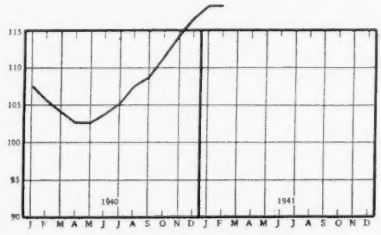
although this figure is approximately 2,000,000 barrels less than was produced in January 1940, it is clearly ascertained that production of petroleum and petroleum products is adequate for all needs and that there is no bottleneck likely to occur in the refining processes.



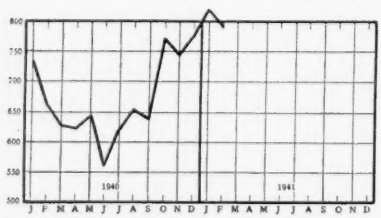
**BITUMINOUS COAL PRODUCTION**
(*Millions of tons*)

Bituminous coal production in February mounted to 41,450,000 tons, compared with 44,070,000 in January and 39,277,000 in February 1940. In March there might be anticipated a further seasonal reduction but instead preliminary indications are that the total for the month will exceed 45,000,000 tons.

As anticipated, factory employment in

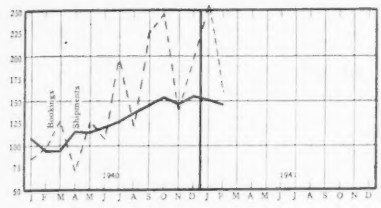


**FACTORY EMPLOYMENT**
(*Adjusted index*, 1923 25=100)



**COTTON CONSUMPTION**
(*Thousands of bales*)

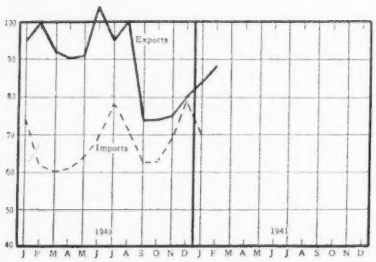
February, on the basis of 1923-25=100 adjusted index, rose to 118.4. While this is not a large increase, it is in sharp contrast to the February 1940 figure of 105.8 which was nearly two points lower than the previous month. That this rise will continue there can be little doubt. Total employment in non-agricultural industries for February 1941 was the highest point for any February on record. Factory wage earners increased 1.9%, or 175,-




**STRUCTURAL STEEL**
*(Thousands of tons)*

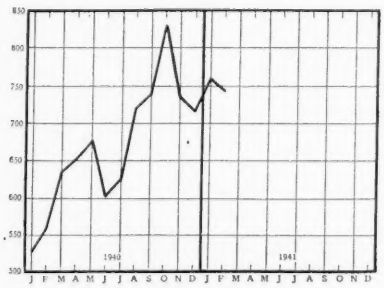
600 in number. At the same time weekly wages rose 4.7%, or approximately $10,-800,000. The industries showing largest employment gains were: automobiles, 14,-100; electrical machinery, 10,100; aircraft, 10,000; shipbuilding, 7,900; steel, 6,900; and foundries and machine shops, 6,700.

Fabricated structural steel orders




**IMPORTS AND EXPORTS**
*(Adjusted index 1923-25=100)*

booked in February totaled 159,815 tons, compared with 266,594 tons in January and 98,882 tons in February 1940. Actual shipments totaled 146,642 tons against 154,234 tons in January and 97,157 tons in February a year ago. February shipments approximated 65% of the total ton-

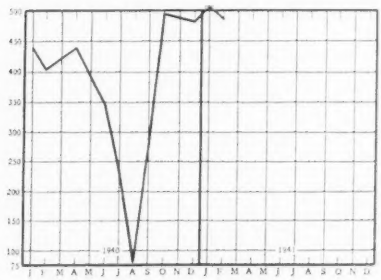



**SOUTHERN PINE PRODUCTION**
*(Million board feet)*

nage shipped during the basic period 1923-25, inclusive. The tonnage available for future fabrication is 796,242 tons. On the basis of the 1923-25=100 adjusted index, exports rose four points to 88 in February from the previous month, and compares with 100 in February 1940. Imports however, which rose three points to 73 from the January figure, are exactly ten points higher than the February 1940 figure of 63. The export figure may be expected to continue higher in the month to come.

Preliminary figures of southern pine production in February indicate a decline from the January figure of 763,000,000 board feet to about 730,000,000 board feet. In spite of this decline, however, this is still nearly 200,000,000 board feet greater than the production of February a year ago.

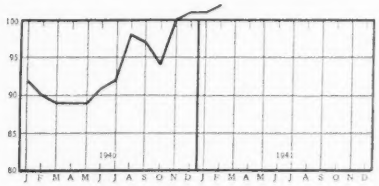
Factory sales of automobiles have been




**AUTOMOBILE FACTORY SALES**
*(Thousands)*

revised to show that the January figure reached the high point of 500,931, and preliminary figures for February show the total for that month to have only fallen about 15,000 to a total of 485,523 against 404,032 for February 1940. Sales for March and April may be expected to continue high and perhaps rise from the February total.

As might be expected from the defense program and increased employment, retail trade continues to rise. Indications



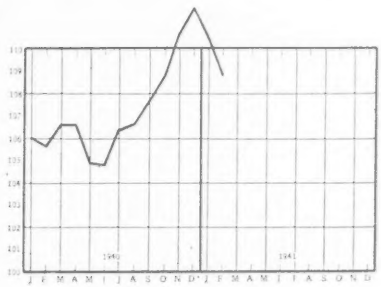

**DEPARTMENT STORE SALES**
*(Adjusted index 1923-25=100)*

thereof are shown by the 1923-25=100 adjusted index for department store sales which shows the February figure at 102. This compares with 101 for January and 90 for February 1940. This rise of even one point from January to February is unusual since there is a decline usually of two or more points.

The average price of U. S. Treasury bonds, which reached their highest point of 111.8 in December, continued to decline in February as they did in January to the same price they held last October, *i. e.* 108.8 dollars per 100-dollar bond.

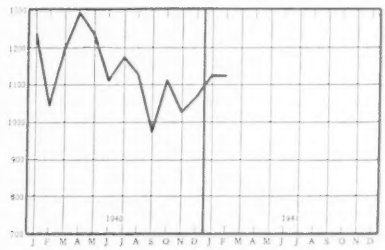
Commercial failures, which numbered 1,129 in February, was only five more than the January total of 1,124. The figure for February 1940 was 1,042. However, on the basis of liabilities, the total remains considerably below last year's amount.

Denatured alcohol production declined




**U. S. TREASURY BONDS**
*(Average price per $100 bond)*

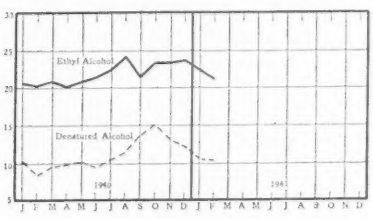
slightly from 10,610,000 gallons in January to 10,556,000 gallons in February. However, consumption that amounted to practically the same as production indicated a slight rise from the 10,499,000 gallons consumed in January. Production of ethyl alcohol also declined slightly, being




**COMMERCIAL FAILURES**
*(Total number)*

22,030,000 gallons in February.

Indicating that chemicals generally are remaining fairly constant as to quantity produced and consumed, the total is slightly above the corresponding figure of a year ago.




**ALCOHOL PRODUCTION**
*(Millions of gallons)*



XUM

# National Defense Program Awards in the South

## ALABAMA

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $109,043,997 |
| Navy Contracts | 33,140,928 |
| U. S. Maritime Commission Emergency Ship Program | 1,322,500 |
| Federal Works Agency | |
| W. P. A. Defense Program | 3,073,046 |
| U. S. H. A. Defense Housing Projects | 1,717,511 |
| Public Buildings Administration | |
| Federal Security Agency | |
| Office of Education Defense Training | 539,217 |
| Federal Loan Agency | |
| Defense Plant Corporation | 9,801,211 |
| Reconstruction Finance Corporation | 16,063,362 |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Gardiner Warring Co., Inc.**, Florence, 240,000 prs. woolen drawers, $263,868.

**Gardiner Warring Co., Inc.**, Florence, 133,000 woolen undershirts, $152,874.

**Gardiner Warring Co., Inc.**, Florence 35,000 winter undershirts, $29,385.

**Charles L. Levy Co., Inc.**, Selma, 45,000 Khaki cotton trousers, $29,328.

**Gardiner Warring Co., Inc.**, Florence, 1,000,000 sleeveless summer cotton undershirts, $158,321.

**Franklin Ferguson Co., Inc., Florala**, 200,000 drawers, cotton shorts, $59,270.

**Berham Underwear Mills**, Scottsboro, 150,000 drawers, cotton, shorts, $42,897.

**Wellington Sears Co.**, Lanett, 1,400,000 yds. herringbone cotton twill cloth, $420,980.

**Alabama Institute for the Deaf & Blind**, Talledega, pillowcases, $1,720.

**Corps of Engineers (Army)**

**Gulf Coast Well & Pump Co.**, Mobile, deep-well pump, Brookley Field, Mobile, $1,050.

**Supplies & Accounts (Navy)**

**Kilby Steel Co.**, Anniston, spike and star cutters, $155,514.

**Miller & Co., Inc.**, Selma, boat-planking, cypress, $6,235.

**The N. C. Lumber Co.**, Montgomery, boat-planking, red cypress, $63,742.

**J. W. Wells Lumber Co.**, Montgomery, templet wood, $21,637.

For the construction, together with architectural and engineering services, of a heavy bomber assembly plant at Fort Worth, Texas, the Austin Company of Cleveland, Ohio, has been awarded a contract by the Corps of Engineers (Army) involving an estimated cost of $10,511,400. Consultant services for construction (of this and an identical plant at Tulsa, Okla.,) will be furnished by the Consolidated Aircraft Corp., San Diego, Calif. Construction of the Tulsa plant will be carried out by Manhattan Construction Co. of Muskogee and the Long Construction Co. of Tulsa at a cost of $10,476,400. The Austin Co. are supplying architectural and engineering service.

## ARKANSAS

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $4,738,468 |
| Navy Contracts | |
| Federal Works Agency | |
| W. P. A. Defense Projects | 2,342,364 |
| Federal Security Agency | |
| Office of Education Defense Training | 341,896 |
| Federal Loan Agency | |
| Reconstruction Finance Corporation | 151,845 |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Berry Dry Goods Company**, Little Rock, 25,000 khaki cotton trousers, $16,250.

The Metals Reserve Corporation has contracted with the Manganese Cooperative Producers Association Company, of Helena, Arkansas, to provide the Government with 100,000 tons of Grade A. manganese during the next three years. The Company will erect a plant at Helena to process the ore.

Funds totaling $8,007,407 have been provided by the Defense Plant Corporation to construct and equip the Dow Chemical Company's Freeport, Texas plant expansion.

## FLORIDA

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $16,809,835 |
| Navy Contracts | 31,754,693 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 15,891,907 |
| U. S. H. A. Defense Housing Projects | 1,605,461 |
| Public Buildings Administration | 1,875,000 |
| Federal Security Agency | |
| Office of Education Defense Training | 263,628 |
| Federal Loan Agency | |
| Reconstruction Finance Corporation | 336,285 |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Maddrix Brothers**, Fort Myers, 5,000 Pyramidal tents, $48,750.

**Biscayne Tent & Awning Co., Inc.**, Miami, Pyramidal tents, $31,260.

**Apalachicola Tent and Awning Co.**, Apalachicola, 3,000 Pyramidal tents, $30,750.

**Supplies & Accounts (Navy)**

**Donald Roebling**, Clearwater, amphibian tractors, $3,240,000.

Construction of a tin smelter at Texas City to be operated by the Tin Processing Corp. of New York (a subsidiary of M. V. Billiton Maatschhappij, Dutch East Indian Smelting Corp.), will be started shortly. Funds for the plant, which will be owned by the Federal government, amounting to $3,500,000 have been provided by the Reconstruction Finance Corp., and the site was donated by the Texas City Terminal Company. Direct shipment of the ore is being arranged by the Grace Line from its source in Bolivia. A contract between the U. S. Government and Bolivian producers assures an adequate supply of concentrates for a five-year period.

## GEORGIA

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $38,200,838 |
| Navy Contracts | 2,989,416 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 5,367,846 |
| U. S. H. A. Defense Housing Projects | 1,704,833 |
| Public Buildings Administration | 1,414,500 |
| Federal Security Agency | |
| Office of Education Defense Training | 737,396 |
| Federal Loan Agency | |
| Reconstruction Finance Corporation | 68,701 |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Holeproof Hosiery Co.**, Marietta, 204,000 prs. woolen socks, $49,878.

**Richmond Hosiery Mills**, Rossville, 60,000 prs, woolen socks, $14,940.

**Happ Brothers Co.**, Macon, 25,000 khaki cotton trousers, $17,250.

**Bellgrade Mfg. Co.**, Winder, 50,000 khaki cotton trousers, $33,915.

**Happ Brothers Co.**, Macon, 15,000 olive drab field jackets, $30,900.

**Peerless Woolen Mills**, Rossville, 3,201.3 olive drab overcoating, $7,469.

A medium bomber assembly plant will be constructed at Kansas City, Kansas by G. L. Tarleton and the McDonald Construction Co., of St. Louis at a cost approximating $7,000,000. The plant will be operated by North American Aviation, Inc., Inglewood, Calif., which also will furnish architectural and engineering services.

## KENTUCKY

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $25,818,994 |
| Navy Contracts | 5,927,364 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 2,822,422 |
| U. S. H. A. Defense Housing Projects | |
| Public Buildings Administration | 1,935,000 |
| Federal Security Agency | |
| Office of Education Defense Training | 576,034 |
| Federal Loan Agency | |
| Defense Plant Corporation | 5,504,611 |
| Reconstruction Finance Corporation | 20,000 |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Merit Clothing Co., Inc.**, Mayfield, 50,000 khaki cotton trousers, $34,500.

**Hopkinsville Clothing Mfg. Co.**, Hopkinsville, 25,000 khaki cotton trousers, $17,150.

**Kane Mfg. Co.**, Louisville, 75,000 khaki cotton trousers, $52,313.

**Cumberland Mfg. Co.**, Princeton, 60,000 khaki cotton shirts, $30,888.

**Louisville Tin & Stove Co., Inc.**, Louisville, component parts for field ranges, $4,830.

**Southern Tent & Awning Co.**, Lexington, pyramidal tents, $17,388.

**Stratton & Terstegge Co., Inc.**, Louisville, component parts for lanterns, electric batteries, $360.

**Ordnance (Army)**

**Logan Co.**, Louisville, conveyor sections, $1,811.

**Louisville Electric Manufacturing Co.**, Louisville, power hacksaws, $4,646.

**Belknap Hardware Co., Inc.**, Louisville, crowbars, $2,938.

**May Hardwood Co.**, Louisville, lumber, $1,560.

**Corps of Engineers (Army)**

**Louisville Electric Mfg. Co.**, Louisville, power hacksaws, $689.

**Supplies & Accounts (Navy)**

**Kentucky River Mills, Inc.**, Frankfort, Ameriaen hemp, $148,500.

**Defense Plant Corporation (Fla.)**

**Reynolds Metals Co.**, Richmond, Va., construct aluminum extrusion plant at Louisville, $3,000,000.

Sullivan, Long & Hagerty, Bessemer, Ala., and Algernon Blair, Montgomery, Ala., have been awarded a contract for the construction of an artillery ammunition bag loading plant at Childersburg, Ala., to be designated "The Coosa River Ordnance Plant."

Wiedman & Singleton of Atlanta received the contract for architectural and engineering services in connection with the construction of this plant, estimated to cost $9,436,816.

This plant will be operated by the Brecon Loading Company, a subsidiary of the Coca Cola Co., Atlanta, Ga., which also will furnish management and consultant services during construction. Cost of operation of the plant is announced as $13,303,001.

This project will operate in conjunction with the Alabama Ordnance Works, a smokeless powder plant in the vicinity of Childersburg, contracts for which have been previously announced. The plant site for the Coosa River Ordnance Plant will embrace approximately 20,000 acres and the cost of machinery and equipment will be approximately $1,091,000.

## LOUISIANA

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $21,201,891 |
| Navy Contracts | 4,811,771 |
| U. S. Maritime Commission Emergency Ship Program | 4,841,000 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 6,686,265 |
| Federal Security Agency | |
| Office of Education Defense Training | 474,103 |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Lee Mfg. Co., Inc.**, Shreveport, 35,000 khaki cotton shirts, $23,800.

**Louisiana Pants Mfg. Co.**, Inc., New Orleans, 50,000 khaki cotton trousers, $34,250.

**Louisiana Pants Mfg. Co.**, New Orleans, 45,000 khaki cotton trousers, $21,825.

**Rex Mfg. Co., Inc.**, New Orleans, 75,000 khaki cotton trousers, $51,750.

**Rex Mfg. Co., Inc.**, New Orleans, 75,000 khaki cotton shirts, $39,000.

**Rex Mfg. Co., Inc.**, New Orleans, 50,000 khaki cotton shirts, $26,000.

**Ordnance (Army)**

**Great Southern Box Co., Inc.**, New Orleans, wire boxes, $1,116.

**Air Corps (Army)**

**Standard Oil Co. of Louisiana**, New Orleans, oil, $151,668.

**Supplies & Accounts (Navy)**

**Higgins Industries, Inc.**, New Orleans, radio transmitting, receiving equipments, $86,525.

**The Federal Loan Agency through the Reconstruction Finance Corp., and the Defense Plant Corp., has awarded $32,801,211 to the Reynolds Metals Company of Richmond, Va., and its subsidiary, Reynolds Alloys Company of Sheffield, Ala. Of this amount $25,601,211 will be used to construct and equip a plant at Sheffield, Ala., for the manufacture of aluminum sheet and structural aluminum shapes; $3,000,000 is for construction of an aluminum extrusion plant at Louisville, Ky. The remaining $4,200,000 will go for another aluminum plant at Bonneville, Oregon.**

## MARYLAND

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $177,357,447 |
| Navy Contracts | 128,162,926 |
| U. S. Maritime Commission Emergency Ship Program | 7,838,000 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 5,422,247 |
| U. S. H. A. Defense Housing Projects | |
| Public Buildings Administration | 4,392,452 |
| Federal Security Agency | |
| Office of Education Defense Training | 567,145 |
| Federal Loan Agency | |
| Defense Plant Corporation | 1,685,000 |
| Reconstruction Finance Corporation | 52,765 |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Ellis Hosiery Co.**, Hagerstown, 575,000 prs. woolen socks, $137,061.

**I. C. Isaacs & Co., Inc.**, Baltimore, 50,000 khaki cotton trousers, $50,000.

**Yale Underwear Co.**, Baltimore, 600,000 drawers, cotton shorts, $179,100.

**B & O Mfg. Co.**, Baltimore, 25,000 one-piece working suits, $27,473.

**A. W. Pruitt**, Crisfield, pyramidal tents, $19,000.

**Baltimore Lumber Co.**, Baltimore, 319,616 sq. ft. plywood, $23,860.

**Maryland Workshop for the Blind**, Baltimore, 35,260 bleached cotton pillowcases, $7,581.

**Signal Corps (Army)**

**Graybar Electric Co.**, Point Breeze, cable, $2,535.

**Graybar Electric Co.**, Point Breeze, protectors, $1,154.

**Graybar Electric Co., Inc.**, Point Breeze, cable reels, $23,700.

**Carey Machinery & Supply Co.**, Baltimore, bench lathes, $9,913.

**Western Electric Co.**, Point Breeze, terminal boxes, $20,030.

**Chemical Warfare (Army)**

**Porcelain Enamel & Mfg. Co.**, Baltimore, soda lime, $7,576.

**Ordnance (Army)**

**Black & Decker Manufacturing Co.**, Towson, saws and grinders, $4,191.

**Black & Decker Manufacturing Co.**, Towson, refaces, $8,175.

**Chemical Products Co.**, Baltimore, paint and varnish remover, $1,260.

**Lasting Products Co.**, Baltimore, varnish, $1,600.

**William E. Hooper & Sons Co.**, Woodberry, Baltimore, cotton duck, $12,699.

**Triumph Explosives, Inc.**, Elkton, assemblies, $455,000.

**Rustless Iron & Steel Corp.**, Baltimore, steel, $1,836.

**Corps of Engineers (Army)**

**Alex. Milburn Co.**, Baltimore, welding and cutting outfits, $671.

**Electrical Industrial Equipment & Supply Corp.**, Baltimore, lighting fixtures, $1,725.

**Black & Decker Mfg. Co.**, Towson, valve-seat grinders, $523.

**Supplies & Accounts (Navy)**

**Revere Copper & Brass Co., Inc.**, Baltimore Div., Baltimore, copper-nickel-alloy plates, $20,177.

**Bendix Radio Corp.**, Baltimore, aircraft radio, $74,477.

**Electric Industrial Equipment & Supply Corp.**, Baltimore, lighting and power wire and cable, $56,806.

**Sanitary Wiping Cloth Co.**, Baltimore, wiping cloths, $7,016.

**Revere Copper & Brass, Inc.**, Baltimore Div., Baltimore, copper tubing, $23,081.

**S. Rosenbloom, Inc.**, Baltimore, dungaree trousers, $47,100.

***Distribution of National Defense Awards by states in millions of dollars. This distribution covers only those contracts awarded by the War and Navy Departments which up till March 15 totaled $11,854,906,935.***

**Reid Avery Company, Dundalk**, Baltimore, welding electrodes, $618,110.

**Revere Copper & Brass, Inc., Baltimore Div.**, Baltimore, rolled naval brass, $44,800.

**Revere Copper & Brass, Inc., Baltimore Div.**, Baltimore, condenser tubes, $17,589.

**The Baxter Paper Co., Inc.**, Baltimore, typewriting bond paper, $11,500.

**The Mudge Paper Co.**, Baltimore, white typewriting and blotting paper, $9,076.

**Revere Copper & Brass, Inc., Baltimore Div.**, Baltimore, copper-nickel-alloy condenser tubes, $84,256.

**S. Rosenbloom, Inc.**, Baltimore, white trousers, $64,125.

**Marine Corps (Navy)**

**Thomas & Company**, Frederick, subsistence stores, $516.

**Maryland Lumber Company**, Baltimore, lumber, $3,159.

**Maryland Lumber Co.**, Baltimore, lumber, $880.

**U. S. Coast Guard**

**Tuller Construction Co.**, Red Bank, New Jersey, construction of floating drydock at Coast Guard Depot, Curtis Bay, $584,740.

**Centaur Construction Co.**, New York, N. Y., construction of two shipways at Coast Guard Depot, Curtis Bay, $1,142,748.

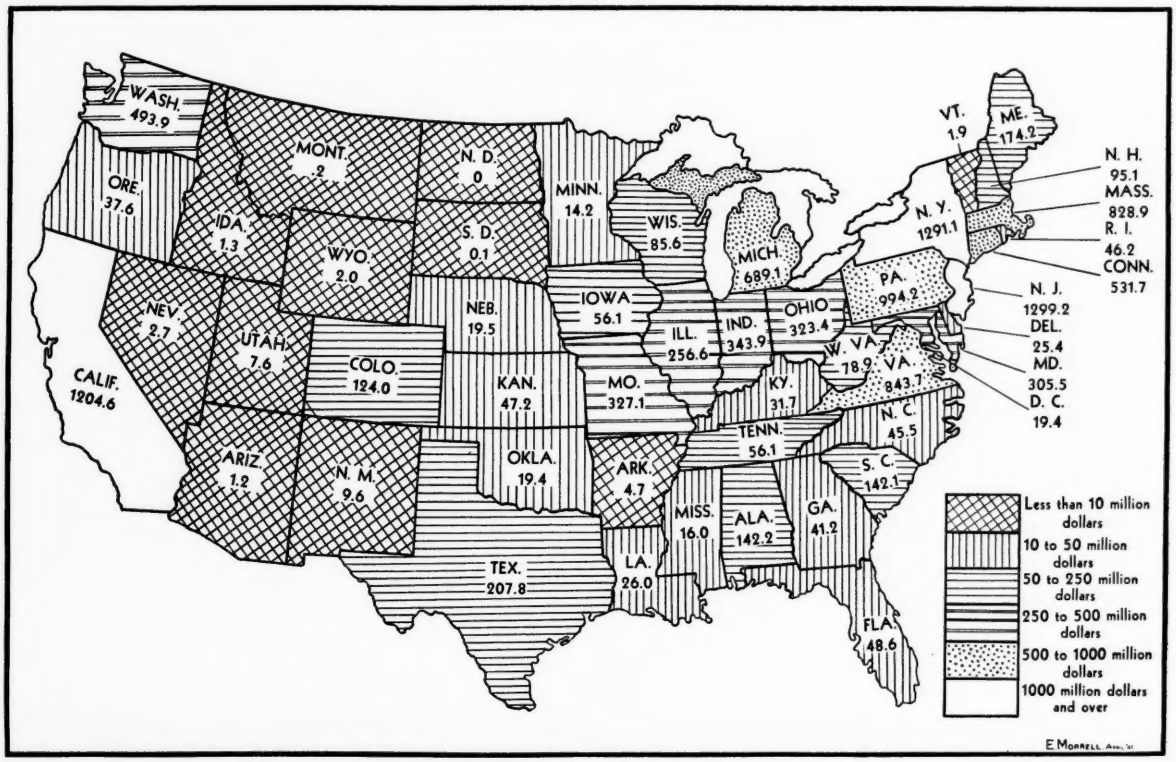
**A plant to manufacture armor-piercing cores for small arms ammunition at St. Louis will be equipped at a cost of $2,961,000 by the McQuay Manufacturing Co., St. Louis, who also have been retained by the War Department to render operation and management services during construction at an additional cost of $1,500,000. The plant, which will be operated on a cost-plus-fixed-fee basis with title to the plant and facilities being retained by the Federal Government, will provide armor-piercing cores for the small arms ammunitoin being produced at St. Louis and Lake City, Mo., and at Denver, Colorado.**

## MISSISSIPPI

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $11,982,161 |
| Navy Contracts | 4,013,696 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 2,652,343 |
| U. S. H. A. Defense Housing Projects | |
| Public Buildings Administration | 148,500 |
| Federal Security Agency | |
| Office of Education Defense Training | 567,812 |
| Federal Loan Agency | |
| Reconstruction Finance Corporation | 150,000 |

(Continued on page 54)






XUM

# Moving Industry's Heavy Loads

*by*

F. L. SPANGLER

## *Space, Labor Costs and Personnel Safety are Prime Factors of System for Assembling Diesel Locomotives*

WHERE many handling operations are required in the processing and finishing of parts and in assembly, it is especially important, when laying out the materials flow chart and selecting materials handling equipment, that consideration be given to space, labor cost, personnel safety, prevention of damage to parts to be handled, as well as many other factors.

In the case of cranes, hoists, elevators, and other rope-operated equipment, it is just as desirable that this analysis be applied to the ropes and slings as to the structures themselves.

Some of the important aspects of this problem will be illustrated by reference to an existing plant making Diesel-electric locomotives, each completed structure consisting of four complete assemblies: the Diesel engine, the electric generator and traction motors, the locomotive body (including under-frame, floor, roof, and sides), and the trucks.

All these various units are assembled in the plant from parts shipped in by rail or truck as either complete units or semi-finished materials. The parts and assemblies to be handled during processing and assembly range in weight from 3 ounces to over 100 tons.

The part of this plant devoted to manufacturing lies entirely on one floor, and consists of 22 bays, all but one of which are served by electric overhead traveling cranes. In addition there are many electric jib cranes and wall bracket cranes provided with hand chain hoists. Lifting trucks and platform skids are used in large numbers.

Seventeen of the 22 bays run in an east-west direction, serving a rectangular area. Along the west of this area is located a cross bay running north and south, where all incoming materials are received. On the east are located four cross bays running in a north-south direction. The first two of these bays are used for the assembly of engines and other parts, the third bay for the assembly of roof, sides, floor, and under-frame of the locomotives, and the fifth bay for final locomotive assembly. All the cross bays on the east are traversed by a gantry crane, and in addition three of them are served by overhead traveling cranes.

The electric overhead traveling cranes range in capacity from 5 to 200 tons. Some of these cranes in the east-west bays are equipped for operation from the floor as well as from the cage. Floor control is used during those times that operation of the crane is not frequent enough to warrant employing a full-time operator. A red light near the cab, visible the entire length of the bay, remains lit during all times that the crane is in, or available for, service. Some of these bays, as well as the cross bays, are provided with two overhead cranes.

A feature of this layout is the means used to permit handling of loads between the cross bays and the east-west bays. The runways of the east-west bays extend several feet into the cross bays on the east and on the west, passing under the runways of the cross bays. Hence, loads may be dropped at the extreme end of any east-west bay and picked up by the crane in the cross bay, or the reverse may take place. In all cases, the crane can be spotted directly over the load, so no side pull is necessary when lifting.

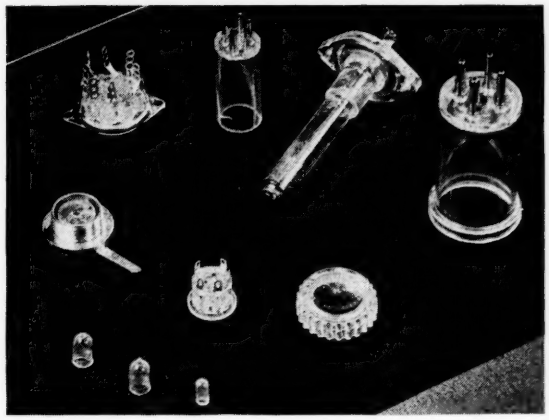
Damage would occur if the runways extending into the cross bays were struck by the load or by the hoist rope or block of any of the cross-bay cranes. This is prevented by providing the cross-bay cranes with an electrical interlock, which prevents the bridge-travel motor from being operated when the trolley is in position near the end of the bridge, where the load or ropes might interfere with the runway extensions on the east-west bay cranes. Hence, to move the cross-bay crane along the runway the trolley must be racked far enough along the bridge to clear the ends of the east-west bay runways, thereby releasing the interlock.

All parts and materials are brought into the plant and routed from the receiving room to storage or to various parts of the plant by lift truck, in the case of crates for small parts, or by overhead crane, where the parts or materials are bulky or heavy.

Where a part is to receive several operations in the course of processing or

(*Continued on page* 47)

# Polystyrene— A Manufacturer's Plastic



*by*

**R. E. BRANNAN,**

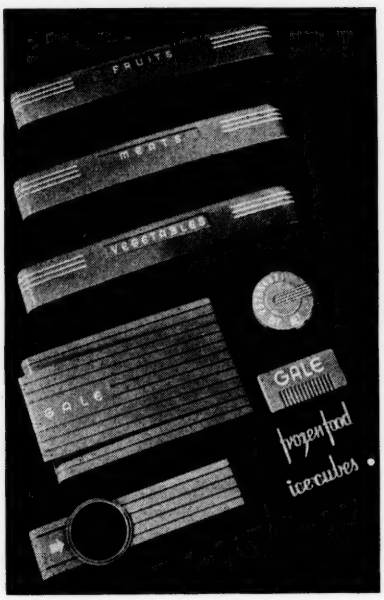
*Manager, Molding Material Sales, Bakelite Corporation*

POLYSTYRENE is one of the newer members of the plastics industry. Among the large family of plastics it stands unique in several respects. The outstanding properties of polystyrene that have attracted the attention of manufacturers are as follows: excellent electrical properties, high index of refraction, ability to carry light, low specific gravity, low molding shrinkage, dimensional stability, acid and alkali resistance, water resistance, and molded finish. Having a crystal-clear clarity, it can be produced in varying degrees of transparency and in any color.

### Industrial Applications of Polystyrene

For three major reasons manufacturers have become interested in polystyrene. These reasons are: economy, electrical properties, and chemical and water resistance.

First, economy—The light weight of polystyrene (specific gravity 1.07) makes it the most economical thermoplastic (cold-set) material, on the basis of molded volume, available to modern industry. Therefore, on a poundage basis more parts can be produced from a pound of polystyrene than from any other thermoplastic. Being thermoplastic, it is molded on high-speed automatic injection presses. The runners and sprues can be cut and remolded—thus saving money and eliminating waste.



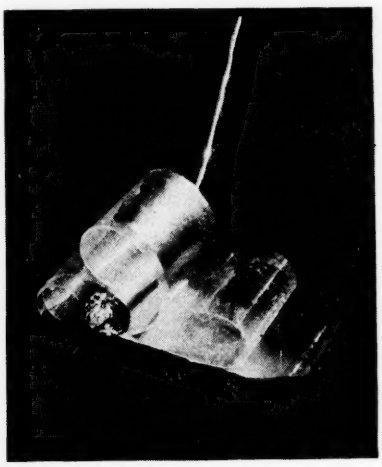



***Figure I (top right)—Low loss coil forms for high frequency receivers and low power transmitters and sockets that eliminate dust at tube bases. Figure II (above)—Polystyrene film, 1 mil. in thickness, provides insulation in low capacitance condensers. Figure III (left) — Water and chemical resistant parts for refrigerators molded from polystyrene.***

Secondly, electrical properties—The material is comparable to fused quartz in insulation properties, which makes it particularly adaptable for use in high frequency circuits employed in television and short-wave radio. It is being used to great advantage in coil forms, lead bushings, tube bases and other parts where the ultimate in low-loss efficiency is necessary (Figure 1). Polystyrene possesses a loss factor of less than .00053, a power factor of less than .0002, and a dielectric strength of more than 500 volts per mil.

One of the newest developments in the radio and television field is the use of polystyrene film in wound condensers of low capacitance (Figure 2). This film, with a thickness of about 1 mil. is wound between the metallic foils, providing excellent insulation. This one-mil. film has a dielectric strength of over 3000 volts. When the efficiencies of various circuits are improved, and the use of ultra-high frequencies becomes more general, polystyrene in various forms should play an even more important part in the field of electronics.

A kindred property of polystyrene is that of transmitting and carrying light through curved sections. This characteristic is employed in the illumination of aircraft instruments. By using polystyrene a difficult problem in design was solved as the material not only had to be capable of carrying light but had to withstand variations in temperature without distortion.

Thirdly, chemical and water resistance—Polystyrene, being chemically inert, can be used in contact with ordinary con-

*(Continued on page 56)*



XUM

# New Industrial Plants and Expansions in the South During March

## Contracts Awarded

### ALABAMA

**CHILDERSBURG**—bag loading plant—Sullivan, Long & Hagerty, Bessemer and Algernon Blair, Montgomery, have contract for construction of bag loading plant; estimated cost $9,436,816; will be known as Coosa River ordnance plant and will be operated by Brecon Loading Co., Wilmington, Del., a subsidiary of Coca Cola Co., Atlanta, Ga.; Wiedeman & Singleton, Archts., Talladega, Ala.

### FLORIDA

**LAKELAND**—food machinery plant—Food Machinery Corp., Courtney W. Campbell, of Dunedin, V. P. will construct plant for manufacture of citrus machinery on site east of city limits; Roebling Construction Co. of Clearwater, General Contractor.

### GEORGIA

**ATLANTA**—addition—Hardin & Ramsey, 161 Spring St., N. W. has contract for addition to plant of Gaylord Container Corp., 276 Miller Reed Ave., S. E.; 1-story; 90x200 feet; reinforced concrete; brick; structural steel; built-up roof; steel sash.

**ROME** — extension — Virginia Bridge Co., has contract for structural steel for extension to plant of Tubize Chatillon Corp., delivery by April 15; A. K. Adams Co., Atlanta, has contract, work underway on concrete foundation for all of the extension; Robert & Co., Inc., Atlanta, Archts.

**ROME**—yarn plant—Tubize Chatillon Corp., E. P. Huff, Secty., Box 635, will erect addition for viscose and acetate rayon yarns; estimated cost of building, $350,000; construction started on foundations; cost of equipment $1,100,000; building will be of brick and steel; concrete floors, wooden-sawtooth roof; Robert & Co., Archt., Atlanta; C. H. Banks, care of Tubize Chatillon, Rome, Construction Engineer; Whitin Machine Works, Whitinsville, Mass. and Max Ams Co., Bridgeport, Conn., equipment contractors; Babcock & Wilcox Co., New York, has contract for boiler; Air & Refrigeration Corp., 11 W. 42nd St., New York, contract for air conditioning; Proctor & Schwartz, 7th and Tabor Rd., Philadelphia, Pa., for dryers; A. K. Adams Co., Atlanta, Ga., has contract for substructure.

**SAVANNAH**—roofing felt plant—Certain-Teed Products Corp., A. H. Miller, executive vice president, completed plans, work started at roofing felt plant; separate building with a daily capacity of 50 tons now under construction will probably be in operation in 90 days.

### LOUISIANA

Pipe line—B. & M. Construction Co., Petroleum Bldg., Oklahoma City, Okla., has contract for constructing 130 miles of 14-in. high pressure natural gas pipe line from Logansport Gas fields near Logansport eastward to line at Perryville for Southern Natural Gas Co., Watts Bldg., Birmingham, Ala.; contract includes other work in connection there at cost of approximately $2,225,000; pipe order divided equally between National Tube Co. and Republic Steel Corp.; no compressor stations contemplated at present; work is being conducted under supervision of Ford, Bacon & Davis Construction Corp. with office at Monroe, La.

**NEW ORLEANS**—shipyard—Boh Brothers Construction Co., 2400 Cypress St., has contract for driving 73 test piles under supervision of J. G. White Engineering Corp., 80 Broad St., New York, in connection with construction of shipyard of Louisiana Shipyards, Inc., on Industrial Canal near Florida Ave.; 6 ways are to be constructed at estimated cost of approximately $5,000,000.

### MARYLAND

**BALTIMORE** — McLean Contracting Co., Fidelity Bldg., immediately start foundation work in connection with new $6,500,000, 67,000 h.p. Riverside generating plant, for which General Electric Co., Schenectady, N. Y., will furnish turbo-generator; Babcock & Wilcox Co., New York, to supply boiler. Consolidated Gas, Electric Light & Power Co. also proposes to construct seven steel towers in Baltimore County, near Dundalk Ave., reinforced concrete foundations, owner builds.

**FAIRFIELD**—shipyard—Booth & Flynn, 1942 Forbes St., Pittsburgh, Pa., has contract for rebuilding 4 existing launching ways for Bethlehem-Fairfield Shipyard, Inc.; project located on property being leased from Union Shipbuilding Co., Gulf Refining Co. and Weyerhaeuser Timber Co.; contract also includes construction of necessary bulkheads and other heavy construction work.

### MISSISSIPPI

**JACKSON** — refinery — Mid-South Refining Co., start work soon on $1,000,000 refinery on a 94 acre tract; refine oil from Tinsley field; Dr. Jack Hall, chemical engineer in charge of building plant.

### MISSOURI

**KANSAS CITY**—bomber assembly plant—G. L. Tarleton and MacDonald Construction Co., 3829 W. Pine St., St. Louis and S. Patti Construction Co., 1114 Broadway, Kansas City, have contract for construction of bomber assembly plant, contract price $3,706,484; estimated total cost $7,000,000; plant will be operated by North American Aviation, Inc., at Fairfax airport; J. Gordon Turnbull, Consulting Engr., Grand Prairie, Tex.

**ST. LOUIS**—factory addition—A. H. Haeseler Building & Contracting Co., 2346 Palm St. has contract for factory and office addition, 6135 Manchester Ave. for Marlo Coil Co.; brick, steel and reinforced concrete; Brussell & Viterbo, Engineers, Arcade Bldg.

**ST. LOUIS** — armor piercing cores — War Department announced award of contract to McQuay-Norris Manufacturing Co., 2320 Marconi, St. Louis, for operation and management services during construction of a plant to manufacture armor piercing cores for small arm ammunition; plant will be located in vicinity of St. Louis small arms plant and will produce cores for small arms plant at St. Louis and Lake City, Mo.; contract estimated at $4,461,000 covers the cost of constructing and equipping the plant; of this amount $2,961,000 will be required for equipment; McQuay-Norris Co. will operate the plant on a cost-plus-fixed-fee basis.

**ST. LOUIS**—addition—William H. and Nelson Cunliff Co., 3320 Lindell Blvd. has contract for 2-story addition to plant of Atlas Tool & Manufacturing Co., Inc., 5147 Natural Bridge Ave.; 109x90 ft.; assembly plant in rear; facade of brick trimmed with stone; glass brick; George Neff, Archt.

### NORTH CAROLINA

**CENTRAL FALLS**—mill building—Burlington Mills Corp., Greensboro, let contract to George W. Kane, Durham, for mill building.

**HAZLEWOOD, R. STATION, WAYNESVILLE**—rubber plant—Merchant Construction Co., 290 Biltmore Ave., Asheville, has contract for plant for Dayton Rubber & Manufacturing Co., Dayton, Ohio; cost $90,000; 1-story; steel, concrete and glass brick; contract for water and sewer lines at the plant will be let soon; company plans to manufacture rubber textiles; a shoe manufacturing plant will be operated in connection with it; Geyer & Neuffer, Archts.

### OKLAHOMA

**TULSA**—bombing plane assembly plant—Manhattan Construction Co., of Muskogee and Long Construction Co., Philtower Bldg., Tulsa, affiliates, have contract for erection of bomber assembly plant to be erected by the Government and operated by Douglas Aircraft Co., of Santa Monica, Calif.; Austin Co., Cleveland, Ohio has contract for architectural and engineering services; plant will be supplied with component assemblies and parts from a plant to be erected at Ypsilanti, Mich.; operated by the Ford Motor Co.; plant will consist of 3 main buildings; largest main assembly plant, a building 4,000 feet long and 320 feet wide; windowless; air-conditioned; City, C. H. Veale, Mayor will vote March 25 on $750,000 bond issue; proceeds of bond issue to be used to provide land for the bomber assembly plant and airport expansion program and for extending water and sewer facilities; cost $10,476,400 with additional government expenditure of $3,000,000 for tooling and equipment.

### SOUTH CAROLINA

**CHARLESTON**—asbestos plant—Charleston Constructors, Inc., Adgers Wharf, has contract for extension to plant of General Asbestos & Rubber Co.; brick; 2-story; 73x112 ft.; standard mill construction; steel sash; concrete floor; sprinkler system; install machinery to care for defense contracts.

**GREENVILLE**—extension—J. E. Sirrine & Co., Inc., Greenville, on behalf of client,

***American Rolling Mill Co. officially started work last month on its $5,000,000 blast furnace at Ashland, Ky., when Calvin Verity, vice president and general manager, turned the first turf with a silver spade used in initiating all major Armco expansions. Upon completion the new furnace will have a daily capacity of above 1,000 tons. American Rolling Mill Co., through its subsidiary the Sheffield Steel Corp., is also beginning on a $17,000,000 steel plant at Houston, Texas.***

Union Bleachery, Inc., released 4 contracts for power plant extension: orders were for one 500 h.p. boiler to Babcock & Wilcox Co., Atlanta, Ga.; multiple retort stoker to American Engineering Co., Philadelphia, Pa.; boiler bricksetting to Fisher Halliday Co., Atlanta; 2 Thermix stacks with built-in induced draft fans to Prat-Daniel Co., East Port Chester, Conn.; one of the stacks for an existing 500 h.p. boiler the other for the new 500 h.p. boiler.

**LYMAN**—addition—Pacific Mills let contract to C. M. Guest & Sons, Anderson, for addition to finishing plant; manufacture sheeting and related products; Lockwood Greene Engineers, Engrs.

**TRAVELERS REST**—power plant equipment—J. E. Sirrine & Co., Engrs., Greenville, let contract for client, Brandon Corp., for power plant extension at Renfrew Bleachery; 400 h.p. boiler, stoker and brick setting to Combustion Engineering Co., Inc., New York; automatic coal handling equipment to Link-Belt Co., Atlanta, Ga.; concrete stove silo to Neff & Fry Co., Camden, Ohio; automatic coal scale, Richardson Scale Co., Atlanta, Ga.

## TENNESSEE

**ALCOA**—aluminum plant—Aluminum Company of America, let contract to Koppers Co., Engineering and Construction Division, Koppers Bldg., Pittsburgh, Pa., for design and construction of a gas producer plant and fuel and ash handling equipment at new plant at Alcoa; 3 producers, each 10 feet in diameter, making high and low pressure steam and using coke for producer fuel; plant will have production capacity of about 18,000,000 cu. ft. of producer gas daily; gas will be distributed at 3 lbs. pressure from the producer plant throughout the aluminum plant.

**CHATTANOOGA** — addition — Tennessee Products Corp., Carl McFarlin, Pres., started work on $1,800,000 addition to plant at Alton Park; doubling present capacity; plans approved by National Defense Commission; plant will be constructed by Wilputte Coke Oven Corp. a subsidiary of Semet-Solvay Co., New York; company has also obtained an option on Roane Iron & Coal Co., Rockwood, Tenn.; plans operation of 2 blast furnaces in the plant; furnace will be used to produce ferro-manganese.

**MEMPHIS**—metal airplane parts—Plant of Fisher Tennessee Division of General Motors Corp., Detroit, Mich., will be converted from production of wood parts for automobiles and truck bodies to the making of metal airplane parts and sub-assembly; new plant will manufacture parts for wings and fuselages for North-American twin-engine, medium bomber, the B-25C, an improved version of the B-25 now being turned out at the North American Inglewood, Calif. plant; all parts will be of metal and sub-assemblies will be made in the Memphis plant and sent to Kansas City, Kans. for final completion; while machinery is being installed on the 250,000 square feet of floor space, construction will be started on expansion that will increase floor space to 750,000 square feet; wood operations will be transferred to other Fisher plants; work on plant will be done under contract and will be started in a few days; federal government is providing all necessary money for enlargement of plant and installation of machinery; Keith Spurrier is manager of Memphis plant.

**MEMPHIS**—refinery—Delta Refining Co., Ronnie B. Smith, Secty., erecting $500,000 refinery on 13 acre site; later plan gasoline cracking plant; E. C. Taggart, engineer in charge of construction; erect office building, storage tanks, high temperature furnaces, fractionating and vacuum towers, heat exchange and condensing equipment, terminal to handle inbound and outbound freight; completion May 1st.; will refine gasoline, burning oils, gas oil and residual fuel oils.

## TEXAS

**FORT WORTH** — bomber plant — Austin Co., Cleveland, Ohio, has contract in the amount of $10,511,400 for construction, architectural and engineering services for erection of bomber plant by the Government to be operated by Consolidated Aircraft Corp., San Diego, Calif.; plant will be windowless; air conditioned; 3 main buildings; largest, main assembly plant, a building, 4000 ft. long and 320 ft. wide; contain a continuous assembly line, moved by mechanical means; feeder bay which is alongside main assembly bay will be 120 ft. wide; contain double railroad siding with cross over tracks; clear height of 40 ft. inside the building, wide assembly bay of 200 ft. and various dimensions of the feeder bays will permit construction of not only B-24 type of heavy bombardment aircraft but ones of 195 ft. span; plant will cover 1,900,000 square feet of floor space; an additional government expenditure of $3,000,000 will be provided for tooling and equipment; $2,500,000 bonds available.

**FREEPORT**—magnesium alloys plant—Austin Co., Cleveland Ohio, is constructing an $8,000,000 magnesium alloys plant under supervision of Dow Chemical Co., Midland, Mich. According to Jesse H. Jones, Federal Loan Administrator, the Defense Plant Corp. has made a commitment of $8,000,000 to build and equip the plant which is to be operated by Dow Chemical Co. Earlier reports erroneously located the plant at Shreveport, La.

***Operations are scheduled to start this month at the Lister, Ala., alumina reduction plant, the first major unit completed under the $35,000,000 defense production expansion program of Reynolds Metals Co. and its subsidiaries. Originally designed to produce 60,000,000 pounds of ingot aluminum a year the plant (shown below) will have a 40,000,000 pound output, because part of the available power is to be used for a $17,500,000 rolling mill and rod plant for which ground was broken a few weeks ago. More than 500 carloads of machinery will go into these rolling and rod making operations, which will include rolling sheets up to 100 inches wide and rods up to six inches in diameter. This plant will be capable of converting 6,500,000 pounds of metal each month. The company's virgin aluminum output will be raised to 100,000,000 pounds annually upon completion of a second reduction plant at Longview, Wash., in the vicinity of Bonneville dam.***

**GALVESTON**—floating dry dock—W. Horace Williams, 833 Howard Ave., New Orleans, La. and Standard Dredging Co., Guaranty Bldg., Galveston, have contracts amounting to $400,000 for dredging and other preliminary work at Todd Galveston Dry Dock plant in preparation for plant's 18,000-ton floating dry dock now being constructed by Alabama Shipbuilding & Dry Dock Co., at Mobile, Ala., under terms of a contract for $1,700,000 including machinery and building costs; will be towed to Galveston upon completion.

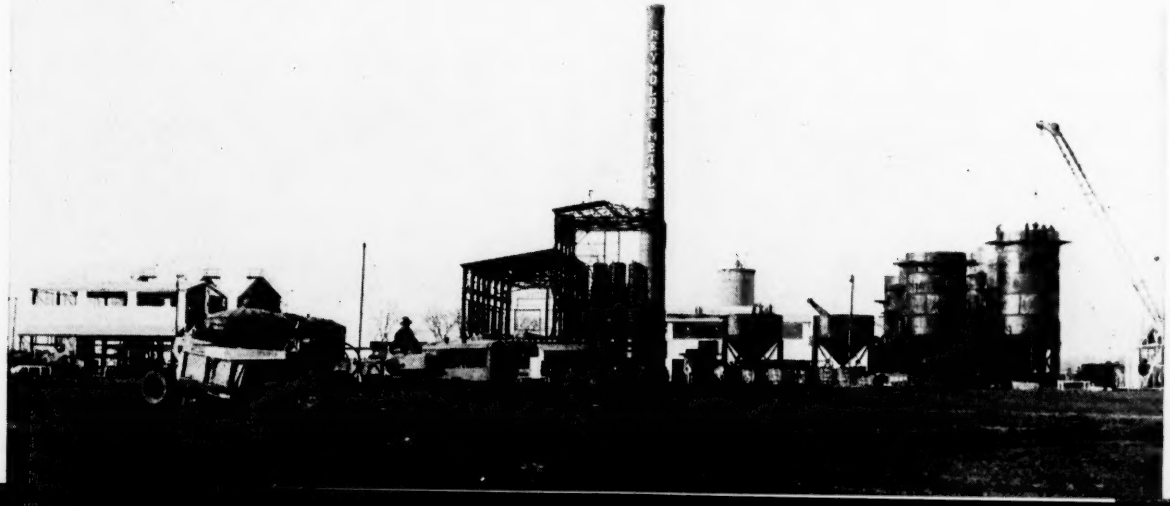
**GRAPELAND** — recycling plant — Hudson Engineering Co., M. & M. Building, Houston, has contract for recycling plant for Geier Bros. and F. B. Jackson, 4102 Emerson, Dallas.

**HOUSTON** — shipbuilding plant — Houston Shipbuilding Corp. approved a contract involving approximately $750,000 with Rust Engineering Co., Clark Bldg., Pittsburgh, Pa., for construction of 12 steel frame buildings at shipyard on Irish Island; work on the buildings to provide quarters for machine shops, layout plants, store houses, and paint shops will start at once; Brown & Root, Inc., 4300 Calhoun Rd., Houston, lately noted awarded contracts for preliminary work costing more than $1,100,000 including clearing island on Ship Channel, constructing roadways and railroad tracks and ship runways.

**HOUSTON** — office-laboratory — Southwestern Construction Co., 3802 Calhoun St. general contractor for office-laboratory building, 1-story; 50x100 ft., and gate house, Deer Park for Shell Oil Corp., in connection with construction of $4,000,000 synthetic rubber plant, let following sub-contracts: Horton & Horton, readimix conc.; Alamo Iron Works, rein. steel and wire mesh; Texas Cast Stone Co., cast stone (Shell Motif); Berger Ornamental Iron & Wire Works, misc. iron 7 metals; Maisey & Page, metal toilet partitions (erected; J. A. Sharman, roofing and sheet metal; Buie-Lunsford Co., rolling metal grille, (erected) and steel sash, (erected glazed and caulked); W. E. Humphreville, lath and plaster; Texas Fireplace & Composition Co., magnesite floor and base; Carter Lumber Co., framing lumber; Prassel Sash & Door Co., millwork; Way Engineering Co., heating gate house; Modern Plumbing & Electric Co., plumbing; Way Engineering Co., air conditioning; Copeland Electric Co., Inc., electrical wiring; C. F. Braun Co., Esperson Bldg., Houston and Alhambra, Calif. has contract for erection of $500,000 toluene plant.

**HOUSTON**—shipyard—U. S. Maritime Commission granted authority to Houston Shipyard Corp., to let contract to Brown & Root, Inc., 4300 Calhoun Rd. for portion of work on $5,000,000 shipbuilding plant; contract covers clearing and grading site, building shipways, crane runways, bulkheads, railroad tracks and roads serving the ship yard, total in excess of $1,000,000; a railroad from Port Terminal railroad, distance of about 1 mile and a highway from LaPorte Rd., distance of

(*Continued on page 58*)



# Inventory Financing Through Field Warehousing

*by*

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RAW material storage as a defense necessity, as well as storage of finished products against the demand that must come if the wars continue, present certain financial problems to manufacturers. Many of these problems may be met by the proper warehousing of inventories under field-warehousing arrangements whereby the goods are placed in the custody of a public warehouseman.

Field, or as it is sometimes called, custodian warehousing is really an instrument of credit rather than strictly storage. What it amounts to is the establishment of public warehouse branches, through which negotiable or non-negotiable warehouse receipts are issued to cover products held in storage on the owner's premises. Actually and legally, however, the goods are under the custodianship of a bona fide public warehouseman.

Field warehousing is, therefore, a plan to store on the premises of the owner, the very products on which he desires to effect a loan at the least cost to himself. It entails the creation of a public warehouse, solely for the purpose of the particular operation, at the place where the goods are normally kept, or in any other convenient place. The motive back of any field-warehousing arrangement, as far as the storer is concerned, is a desire on his part to enlarge his credit. In other words, he endeavors to place his products, finished goods or raw materials, in a position that will enable him to pledge them as collateral for a bank loan. Almost without exception as soon as the credit need passes the field-warehousing arrangement is abandoned.

Field-warehousing has been adopted by many manufacturers, particularly those whose annual production is completed within a few months each year. It is also extensively used by producers of industrial raw materials. Among the goods stored in field warehouses under public warehouse receipts are: all types of canned goods, shoes, textiles, flour, clothing, wine, liquor, pulp and paper, steel and iron, furniture, petroleum and its products, sugar, cement, paint, rubber goods, raw rubber, meats and meat products, dairy products, lumber, automobile tires, radios, refrigerators, toys, plumbing and heating supplies and machinery. It has been estimated that at some time or other within the last few years some 600 different classifications of industry or commodities have been used as collateral for field warehouse receipts. Several large field-warehousing organizations are today handling in excess of 100 different products in field warehouses under their control. Almost any product that can be stored may be used as collateral under field warehousing for as long as a method can be devised for a public warehouseman to take actual and exclusive possession of property, he can issue warehouse receipts against it.

When a manufacturer or distributor finances through field warehousing the cost of working capital loans is borne entirely by the inventory. This is logical because the inventory in many businesses represents the largest current asset. Besides being cheaper than other types of loans, inventory loans are flexible. That is, they may fluctuate with seasonal needs, thus giving the borrower far greater control by leveling out his production and constantly assuring himself of an adequate supply of materials or stock of finished goods on hand.

***Above is a tank used as a field warehouse, the valve being secured by a special type padlock and the warehouseman retaining the key. Below are sacked goods in a warehouse. In both cases warehouse notices are prominently displayed.***

*Photos by courtesy of Lawrence System*

A manufacturer's shortage of raw materials is unnecessary under the present method of using field warehouse receipts for inventory financing. Manufacturers with a good operating record can use almost any raw or processed material for borrowing purposes, thus to purchase and store additional supplies.

When loans are made on the security of a segregated portion of raw or finished products the bank controls them every minute. The borrower cannot withdraw any part of them without an order from the bank to the agent in charge of the field warehouse in which they are stored. Before issuing such an order a bank may demand that other raw materials be delivered to the warehouseman to make good on the withdrawals (in value), or that payment be made on the loan. Or, if finished goods are the security, the warehouse receipt will be replaced by a

(*Continued on page* 62)

*Three projects to contain 852 units*

# Newport News Meets Housing Demands

NEWPORT NEWS, the second city in Virginia to undertake an USHA-aided slum clearance and low rent housing program, was fortunate in being able to meet the emergency created by the present defense activities in their immediate area. The local Housing Authority was fully acquainted with the type and availability of housing in the city, knew the normal rent levels, and had made a basic study of incomes in industry and other places of employment. This information enabled the Housing Authority to apply to the USHA for funds with which to build 500 dwelling units for defense workers which, at the end of the emergency, would revert to a low rent character.

Three projects are now being built by the Housing Authority of the city of Newport News with the aid of the USHA. Harbor Homes, the original Negro development, has 252 dwelling units. Marshall Courts has 352 units for white defense workers and their families. Orcutt Homes comprises 148 units for Negroes employed in the defense program. This total of 752 dwelling units is well within the market limits for low income families during normal employment periods and will create no serious complication in the real estate market with the decline of the defense program.

One notable feature of the local Housing Authority's program is the permanent type of construction being used on all three projects. This is not only a guarantee of useful life during the long term financing period but an assurance of low maintenance and operating costs that are so essential to their ultimate low-rent character. The Virginia Rating Bureau has given these dwellings an AAA insurance classification and a special low rate.

***Top—The Marshall Courts project with 352 units. Top left—Orcutt Homes comprises 148 units for defense workers. Below—Marshall Courts has 352 units for defense workers.***

### Type of Construction

The majority of all dwelling units are in two-story row houses with nine to twelve units to a building. Due to the highwater table, no basements have been provided, but concrete foundations have been carried down to a firm footing. The first floor is a concrete slab laid on compacted fill within the foundation walls, the top portion of which is a clean gravel. Over the gravel is a thick layer of waterproofing, on top of which the floor slab is poured. The second floor and roof are of concrete beam and slab design, supported by columns carried from footings below the first floor slab. The walls are of face brick supplied by the Sanford-Brick Co., of Sanford, N. C., with cinder block backup. The cinder block used is High Pressure Steam-Cured Cind-R-Bloc, furnished by Cinder Block, Inc., of Roanoke. Nonferrous ties hold together the brick face

*(Continued on page 64)*

XUM

# Utilities and Defense

The important part that the electric power utilities are taking in defense work is illustrated by the way in which the Carolina Power and Light Company has met on time and in full volume as needed the extraordinary demands for power and light by the huge defense establishment at Fort Bragg, North Carolina, where the United States government is building probably the largest undertaking of the kind so far attempted.

The finished program is estimated to cost $34,000,000 when completed by June 15, which is the time limit. In September, 1940, it was taken over by private contractors. Prior to that time the construction quartermaster had spent $2,000,000. So far more than $18,000,000 has been expended at this world's largest artillery post for national defense purposes, and it is not without interest that the huge job is expected to be finished a month ahead of the schedule originally mapped out by the War Department.

Officials report the entire project is now about 75 per cent complete. The War Department has already accepted completed housing units for 17 full regiments, and the job when finished will have housing facilities for the 72,000 officers and men slated to be stationed here.

The entire utilities system, which will include 93 miles of standard paved highway, 75 miles of water mains, 60 miles of sewer lines, and 60 miles of electric lines, is being completed on schedule.

To take care of the greatly increased demand the power company has had to enlarge its substation and transmission facilities at Fort Bragg and at Fayetteville, where much building has been done to house non-commissioned officers and their families, as well as to provide living quarters for defense workers.

Last August Fort Bragg had a maximum demand of 1,000 kilowatts, and it is estimated that by the coming August the demand will have increased to 6,500 kilowatts.

## U. S. Steel Subsidiaries to Present New Type Exhibit

United States Steel Corporation subsidiaries will present a new type of exhibit at the Inform-a-Show to be held in the Stevens Hotel, Chicago, May 26-29, in connection with the 1941 convention of the National Association of Purchasing Agents.

One of the most colorful sights of the steel industry, a hot saw cutting red hot sections of steel pipe, will be featured in this exhibit. An operating model will show the red hot steel advance under a saw on a runout table and be cut in a shower of sparks. Supplementing this demonstration will be an operating diorama illustrating the ingot-stripping operation, another of the interesting scenes in the steel industry.

Cooperating in this joint display will be American Bridge Company, American Steel & Wire Company, Carnegie-Illinois Steel Corporation, Columbia Steel Company, National Tube Company, Scully Steel Products Company, and Tennessee Coal, Iron & Railroad Company, all subsidiaries of United States Steel Corporation.

## 1216 Airplanes Produced in March

The Office of Production Management states that during March, 1216 airplanes were delivered by United States manufacturers to the Army, Navy, British, other governments and commercial airlines; 1074 were delivered to the Army, Navy and the British.

## Increased Air Service for the South

A new airplane route between Birmingham, Ala., and Pittsburgh, Pa., has just been inaugurated by Pennsylvania Central Airlines. For the first few days service consisted of one trip daily but traffic increased so rapidly that three trips are now operating. Douglas DC-3's carrying 21 passengers stop at Knoxville and Chattanooga while Boeing transports make intermediate stops at Clarksburg and Charleston, W. Va., and Tri Cities, Tenn., (Bristol, Johnson City and Kingsport). Another stop will be made at Wheeling, W. Va., when that city's airport is completed.

Other Penn-Central services being stepped-up include the doubling of schedules on the Norfolk-Knoxville route and three trips instead of two daily on the Norfolk-Detroit route.

## S. S. Solon Turman Launched At Maryland Shipyard

Fourth of five vessels to be built for Lykes Brothers Steamship Company, of New Orleans, at the Sparrows Point Yard of Bethlehem Steel Company, Shipbuilding Division, the S. S. SOLON TURMAN was launched last month. The new vessel, the keel of which was laid on September 20, 1940, is of the Maritime Commission's C1B type. Mrs. Solon Brinton Turman of New Orleans was sponsor at the launching. Her husband, for whom the vessel is named, is Vice President of Lykes Brothers, and has charge of the Company's New Orleans office.

The S. S. SOLON TURMAN has a dead weight capacity of 9,075 tons, a displacement of 12,875 tons and a cargo carrying capacity of 7,786 tons. Accommodations are also provided for eight passengers. The principal dimensions are as follows: Length over all, 416 ft.; length between perpendiculars, 395 ft.; breadth, 60 ft.; depth to main deck, 37 ft. 6 in.; draft, 27 ft. 6 in.; speed, 14 knots.

## 784 Plants Expanded to Date for Defense Work at Cost of $2,138,000,000

The total value of major defense contracts awarded by the War and Navy Departments from June 1, 1940, through January 31, 1941, was $12,575,869,000.

Since that time, the U. S. and British governments have been instrumental in plant expansions involving 784 plants having an estimated total cost of $2,138,000,000. Of these, the U. S. government has awarded contracts or issued letters of intent for the construction or expansion of 302 plants at an estimated cost of $1,574,000,000 up to March 1, 1941. The British government has financed expansion of 61 plants in the amount of $171,000,000. Certificates of Necessity, which entitle owners of plant facilities to an accelerated rate of depreciation for tax purposes on plants required for the National Defense Program, have been approved for the expansion of 421 plants at an estimated cost of $393,000,000. The latter plants are privately financed.

Between May, 1940, and January, 1941, there has been an increase of 1,445,000 persons working in non-agricultural industries. The increase from January, 1940 to January, 1941, was 1,868,000 employees. In manufacturing industries alone there has been an increase of 968,000 persons from May to January. Most of this increase has been in the durable goods industries in which employment has increased by 721,000 persons, or 19%.

## Third Annual Paper Festival At Savannah

The Third Annual Paper Festival will be held at Savannah, Ga., April 16 through April 19.

While there will be serious talks and public exhibits dedicated to the Southern woodpulp industry, most of the program will be in a lighter vein.

Colorful night parades, coronation ceremonies, water shows, dances indoors and out are included on the four-day program when Savannah's 10,000 azalea bushes are expected to be in full bloom.

It was in Savannah that the late Dr. Charles Holmes Herty conducted his experiments in the field of fast-growing Southern woods. His work is being continued by the Herty Foundation.

# Westinghouse to Build Largest Fluorescent Lamp Plant in West Virginia

To fill lighting needs of new industrial plants engaged in national defense work, Westinghouse will build immediately at Fairmont, W. Va., the largest plant in the world devoted exclusively to the manufacture of fluorescent lamps, at a cost of $3,000,000, David S. Youngholm, vice-president, announced recently.

The new plant will be windowless and adapted for complete blackout in emergency. From 800 to 1000 workers will be employed, and operation is scheduled to begin in July.

With an immediate production capacity of 50,000 units per day, the plant will have an estimated peak output of 200,000 units per day. Most of the employes will be women, as they are more adept and skillful than men in many lamp manufacturing operations.

Site of the factory is a 90-acre tract on the Monongahela River, 3 miles from the center of Fairmont. Built according to modern practice in industrial architecture and design, the new plant will be a one-story building without windows or sky-lights, 830 feet long and 220 feet wide.

An important consideration in locating the new plant at Fairmont is the ready availability of natural gas. Gas jets on lamp-making machines mold the glass bulbs automatically and perform a sealing operation. Natural gas also will be used to heat the plant. When the plant is in full operation 40,000,000 cubic feet of gas per month will be used.

The building will have a cantilever roof. There will be a middle working aisle 830 feet long, by 100 feet wide, unobstructed by pillars, and flanked by two bays each 60 feet wide and as long as the building. Provisions are being made for a modern infirmary, recreation room, and cafeteria. The plant will be served by three sidings from a spur of the Baltimore and Ohio Railroad.

## Catalog of Used Machine Tools to be Made Available

A complete catalog of all used machine tools which are for sale anywhere in the United States will be compiled as a result of changes in the method by which tool dealers report their sales, purchases and inventories under the second-hand machine tool price schedule.

Defense contractors who need machine tools will be able to inspect this catalog in the Machine Tool Section of the Production Division, Office of Production Management at Washington, D. C., and will have the help of officials of that Division in getting in contact with dealers who have the tools they need.

Dealers have been notified of a change in the type of machine on which reports must be made. Previously, no machine selling for less than $500 had to be reported. Hereafter, all floor type machines must be reported regardless of price.

## New Life Insurance Shows 5.0 Per Cent Increase for February

New life insurance for February showed an increase of 5.0 per cent over February of last year, according to the Association of Life Insurance Presidents.

All classes contributed to the February increase. New Ordinary insurance amounted to $408,953,000 against $397,891,000—an increase of 2.8 per cent. Industrial insurance was $136,166,000 against $125,226,000 — an increase of 8.7 per cent. Group insurance was $44,251,000 against $38,120,000 — an increase of 16.1 per cent. For the month, new business of all classes of 39 companies was $589,370,000 against $561,237,000 for February of 1940—an increase of 5.0 per cent.

## Aircraft Manufacturing Expansion

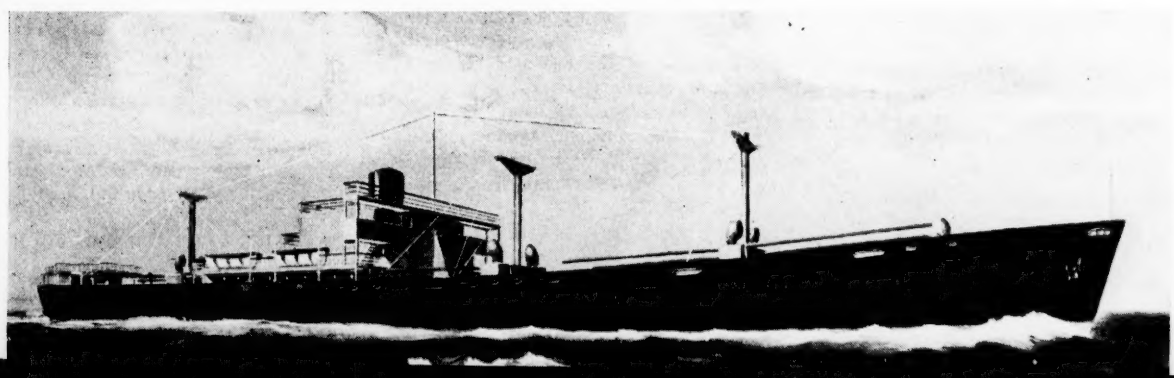
The American aircraft manufacturing industry, working under the spur of national defense needs and British aid requirements, increased its productive facilities 28 per cent in the 59 days between January 1 and March 1 of this year, according to Col. John H. Jouett, president of the Aeronautical Chamber of Commerce of America.

A new survey shows a total of 24,122,230 ft. of productive floor space in operation by plane, engine and propeller companies on March 1, as compared to 18,782,879 sq. ft., on January 1. That is an increase of 5,339,351 sq. ft., or 28 per cent.

During the same period, 27,261 additional shop employees were hired, and in a vast majority of cases, placed in training by the companies. These new hirings brought to 173,076 the total of shop employees in plane, engine and propeller plants on March 1, as compared to 145,815 on January 1, a 19 per cent increase.

Col. Jouett pointed out that the survey did *NOT* cover aeronautical manufacturing activities of the automobile industry.

***Contracts for all of the 200 standard design cargo vessels (shown below) in the Maritime Commission's emergency shipbuilding program have been cleared with the Office for Production Management and signed, it is announcd by the Commission. The last contract to be cleared and signed is for 25 ships to be built by Delta Shipbuilding Co., Inc., subsidiary of American Shipbuilding Co., Cleveland, Ohio, on the facilities of the Louisiana Shipyards, Inc., at New Orleans, La. Under the terms of the contract the company will produce the first ship within 389 days from the effective date, March 18, and the last of the 25 vessels is to be completed within 800 days. The base construction cost of the 25 ships is to be $37,500,000, the contractor to receive a fee of $110,000 a vessel, which can be reduced to $60,000 in event of late delivery or excessive costs, or increased to $140,000 per ship for expedited delivery and reduced costs. Previous contracts for 175 of the emergency program ships were awarded to: Houston Shipbuilding Co., Houston, Texas, 25; Alabama Drydock and Shipbuilding Co., Mobile, Ala., 13; North Carolina Shipbuilding Co., Wilmington, N. C., 25; Bethlehem-Fairfield Shipyard, Inc., Baltimore, Md., 50; Oregon Shipbuilding Co., Portland, Oregon, 31; California Shipbuilding Co., Los Angeles, 31. The Commission completed award of contracts on February 14 for the shipyard facilities for the construction of the 200 ships, and progress on the yards indicates keels can be laid in all of them within the next 45 to 60 days. In addition 212 vessels are to be built for Britain and her allies in existing shipbuilding plants. The additional vessels will probably be 50 per cent of the emergency type and 50 per cent of the standard type (C designs and some tankers). Under the President's program, 56 new shipways will be constructed in the existing plants, 28 of them in six yards now engaged in building the standard designs in the Maritime Commission's long-range program. Twenty-eight more will be constructed in the emergency yards for which the Commission contracted during January and February.***



XUM

# Florida's Invitation to Industry

*by*

**Hon. SPESSARD L. HOLLAND**

***Governor of Florida***

THE agricultural and tourist enterprises which now form the basic and principal sources of income of our people are both of a seasonable nature. In these circumstances, it is natural that Florida should give every encouragement to the location within her borders of industries which would provide the stability of steady, year-around payrolls through uniform monthly business activity.

Florida offers many attractions to industry. To begin, Florida has perhaps the most favorable legislation of any state with regard to corporations. Our state has no corporation income tax, and certain classes of industrial plants are, until 1948, by constitutional amendment, specifically exempt from all taxation, excluding only real estate not actually used in their operation.

No better evidence of the attractiveness of Florida Corporation Laws can be found than the factual record of businesses incorporating in the state. During the period from 1868 to 1925, 18,237 corporations secured franchises, as compared with 40,376 franchises obtained in the years from 1925 to 1941. I am confident that a thorough examination and investigation of the corporation laws in the various states will reveal that Florida offers a real and substantial inducement to industry.

As Governor of Florida, impressed as I am with the many advantages accruing to our people through the presence of year-around industries, it will be my policy to offer every incentive to manufacturers interested in establishing in our state. I can assure these concerns of the full cooperation of the various State departments, as well as the Governor's Office, in providing all available information and possible assistance. I feel too that I may confidently express the complete cooperation of the State and local Chambers of Commerce, including that of the various municipalities, many of which in the past have made extraordinary concessions to secure the location of factories within their limits or near by. In the future, Florida will continue to give every encouragement to industry.

As the fastest-growing state in the Union, Florida offers a continually expanding market for all products, and with its thousands of acres of undeveloped land containing untold latent natural resources, with its countless uncultivated crops and their many possible by-products, affords a boundless opportunity for industrial pioneering.

Tourists, manufacturing and agriculture are the leading sources of livelihood in Florida. In the year 1939 tourists spent an estimated $300,000,000 to $500,000,000, and the state's manufactured products were valued at approximately $220,000,000.* In contrast, its agricultural products were estimated, for that year, at $118,506,000 of which the citrus crop comprised $58,666,931. It is evident that Florida has already made notable industrial advances.

Lumber, for many years, has been one of the leading industries of the state. The value of all forest products is now estimated annually to exceed $50,000,000. Of a total land area of 35,000,000 acres, approximately 22,000,000 acres are forest. By sound conservation methods, including a proper reforestation program, this supply of raw material will be available for expanded lumber industries. It is noteworthy that the products of Florida's forest industries, by and large, are of small labor content. In view of an adequate supply of labor, pine and cypress lumber could be further processed for use in the building trades. A favorable opportunity exists for the establishment of a furniture industry, using these and other woods from Florida and from the West Indies. The shipbuilding industry, already under way in Tampa and Jacksonville, is still another use for Florida lumber within the state. The mild climate would permit work to continue throughout the year.

Several pulp and paper mills have been established in Florida in the last several years, using local timber, such as small slash pine. Extensive areas of the state are still available for this industry. At present most of the products of these mills are sent outside the state for further processing. This could be done within the state, and such products could be used for the manufacture of plastics, textiles and chemical products.

Pitch and tar were among the first products of Florida's pine forests. They are still available in large quantities, and in recent years have found an increasingly wide use, owing to the efforts of research chemists. Naval stores producers in Florida have always shipped the major part of their raw products of turpentine and resin outside the state to be converted into finished products. Much resin is used in the manufacture of writing paper, plastics and linoleum. It is noteworthy that pulp, as produced in Florida, is a principal ingredient used in the production of these commodities, making their manufacture in the state especially attractive.

The canning industry is in its infancy, and nowhere could be more profitably expanded than in the canning of citrus fruit. The flavor of the mature grapefruit can be almost perfectly retained by proper canning, and it is probable that experimentation will yield the same result for oranges. Marmalade and preserves made from oranges and the native kumquat could be produced more extensively, as could candied or crystallized grapefruit and orange peel, as well as jellies and pastes made from guavas, blackberries, plums, mangoes and other non citrus fruit. Only limited use is now being made of the hulls and pulps from these operations for cattle and poultry food, where as demonstration has established them as satisfactory animal feeds. They are also sources of pectin and oils. Cordials, brandy, liqueurs and wines could be more extensively produced from the Florida orange, grapefruit and other fruits. The canning of vegetables offers an opportunity which is real, and has not been fully explored. Most of Florida's winter vegetables, as now produced, can

(*Continued on page* 64)

*The latest available figure for manufactured products is $217,044,982, for the year 1937.

# Encouraging North Carolina's Industrial Growth

*by*

**Hon. J. MELVILLE BROUGHTON**

***Governor of North Carolina***

THE relationship between capital and labor in North Carolina is remarkably harmonious: The State favors liberal, but not radical labor regulation. It follows the same principle in taxation, and its continuing revenue act, which is open to amendment at each legislative session but is not rewritten biennially, divides the cost of government in a manner generally regarded as equitable.

Encouraging the growth of our present industrial establishments and welcoming new business and manufacturing enterprise, we are fully aware of the importance that the amicable relations between government and business, and between capital and labor continue.

We believe there is evidence more eloquent than words as to North Carolina's attitude toward industry in the new census which shows that this state leads the entire South in number of wage earners (3.42% of the national total), in wages paid (2.19% of the national total), and in value added to raw materials through manufacture (2.21% of the national total).

This leadership represents the peak of progress in industrialization that has been conspicuously upward since 1919.

The steady industrial development that has characterized this state in the last three decades was emphasized in 1940 when 61 new industries and 91 additions to existing plants were established here.

Anticipating requirements of this continued growth and the emergency stepping-up of productive capacity in the Defense Program, one of the state's major utilities has just announced a $3,000,000 addition to one of its steam generating plants that will increase its available horsepower to 465,000. Similar increases, projected or under construction, will provide ample power for industries availing themselves of North Carolina's natural resources, ample and intelligent labor, industrial management and transportation facilities.

The state now ranks fourth in the nation in hydro-electric capacity. Its total production last year was in excess of 2,500,000,000 kilowatt hours which was distributed over a system of inter-connected transmission lines. Of this vast power supply, nearly a billion and a half kilowatt hours originated from water power.

The supply of intelligent labor is abundant and its proportion of foreign-born is negligible. More than 70 per cent of the population is white, and its adaptability to industrial development is strikingly evident in the advance of the state as emphasis shifted to industry from agriculture. With only one city (Charlotte) of more than 100,000 population, this industrial development has been marked by a freedom from problems prevailing in metropolitan areas.

A large portion of the state lies within or borders upon the designated defensible area, in which already are located many major industrial plants with essential raw materials close at hand.

Already defense needs have brought new emphasis to the state's wealth of mineral resources. A greater variety of minerals can be found here than in any other state, and North Carolina is recognized as having the largest known commercial deposits of the non-metallic minerals, including mica, kaolin, spodumen, kyanite, talc and pyrophillite. Metallic minerals, such as gold, silver, copper, chromite, manganese, lead-zinc, tin and nickel are being mined in western and west-central counties.

Timber is available in abundance.

Climate is ideal. The annual mean temperature for the State is 59 degrees Fahrenheit. This ranges from 55 degrees in the mountains, where the extreme altitude is 7,000 feet, to 62 degrees of the coastal plains.

North Carolina is within 600 miles of 55 per cent of the entire population of the nation. It is served by five trunk rail lines and 30 shortlines, two routes North-South of Eastern Air Lines and one East-West of Pennsylvania-Central, deep sea ports at Wilmington and Morehead City, and the inland waterway extending the length of its seaboard. The State highway system includes nearly 60,000 miles of road, of which more than 4,000 is hard-surfaced.

There is no state tax upon real property, although the state supports its entire public school and highway systems. There is a constitutional requirement that the state and its sub-divisions retire three dollars of old debt for each two dollars of new debt incurred. There is a three per cent sales tax, from which, by enactment of the 1941 Legislature, food for home consumption is exempt.

North Carolina produces more flue-cured tobacco than any other state and manufactures more tobacco products. Its textile and furniture industries are among the most important in the nation, and of late it has enjoyed phenomenal development of pulp and paper and chemical manufacturing enterprise.

The plant of the Aluminum Company of America at Badin is a principal source of this vital defense metal.

North Carolina offers every assistance to industry. It is industrial-minded, and the policies of its government have been directed toward broadening its economic base. Through its Division of Commerce and Industry, information gathered in exhaustive surveys is available to business enterprise, large or small, for establishment of new facilities or expansion of existing plants in the state.

An industrial engineer, J. T. Anderson, with headquarters in Raleigh, is the director of this clearing house of information. Its facilities are available to every worth-while industry wishing to share the advantages of the state that is known as, and we believe justly so, "The Balanced State."

In this critical era, North Carolina is eager for its vast resources, productive and potential, to be utilized to the utmost in the cause of National Defense.



XUM

# Aluminum Company Expansion

Announcement of firms furnishing equipment for the new rolling mill being constructed at Alcoa, Tenn., by Aluminum Company of America again focuses attention on the $150,000,000 expansion being carried out by the company at various points throughout the country. Two big hydroelectric projects are now progressing in North Carolina, an extension at Badin in the same State is also active, and reports indicate the possibility of further enlarging the practically new Aluminum Ore plant at Mobile, Ala. Aluminum Company expansion has also included purchase of an additional 50 per cent interest in the American Magnesium Corp. to make the latter a wholly-owned subsidiary and to extend its operations further into a field vitally important to aircraft production. Expansion of the Alcoa works is so large that the process has been described as cramming 20 years of normal plant expansion into 18 months.

Aluminum Company forces act as general contractor on the Alcoa operations, which are part of the privately financed $150,000,000 covering additions to fabricating facilities at Lafayette, Ind.; Los Angeles, Calif.; New Kensington, Pa.; Detroit, Mich.; Cleveland, Ohio; Edgewater, N. J.; Masenna, N. Y., where the company is increasing its output of castings, sheet, tubes, screw machine products, rivets, extruded and rolled shapes, rods, bars and forgings. The tremendous expansion of the company's mining and metal producing divisions will mean that the ingot capacity will be 700,000,000 pounds by the middle of next year, or double the 1939 level.

Among the concerns who will furnish the Alcoa equipment are:

Alliance Machine Co., Alliance, Ohio, cranes;
Allis-Chalmers Manufacturing Co., Milwaukee, Wisc., electric motor drives;
American Bridge Co., Pittsburgh, Pa., structural steel erection;
Babcock & Wilcox Co., New York, boilers;
Benjamin Lassman Co., Pittsburgh, Pa., hydraulic equipment;
E. W. Bliss Co., Brooklyn, N. Y., through Salem, Ohio works, cold sheet mills, hot slab side shear;
Cleveland Crane and Engineering Co., Cleveland, Ohio, crane;
Galland-Henning Manufacturing Co., Milwaukee, Wisc., scrap baling presses and auxiliary equipment;
Gehnrich Corp., Long Island City, N. Y., furnaces;
General Electric Co., Schenectady, N. Y., power transformers, electric motor drives, screw down motors;
Ingersoll Milling Machine Co., Rockford, Ill., milling equipment;
Koppers Co., Pittsburgh, Pa., gas producer plant;
Lewis Foundry and Machine Division of Blaw-Knox Co., Pittsburgh, Pa., coiling equipment;
Link-Belt Co., Chicago, Ill., coke storage conveying equipment;
Mesta Machine Co., Pittsburgh, Pa., hot slabbing mill;
Morgan Engineering Co., Alliance, Ohio, hot slabbing mill;
Northern Engineering Co., Detroit, Mich., cranes;
Reliance Electric and Manufacturing Co., Cleveland, Ohio, table motors;
Swindell-Dressler Corp., Pittsburgh, furnaces;
United Engineering and Foundry Co., Pittsburgh, Pa., cold sheet mills; rolling mill pinion stands and drives, rolls;
Virginia Bridge Co., Roanoke, Va., structural steel erection;
Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa., electric motor drives.

## Men and Volts, A Story of General Electric by John Winthrop Hammond

The preface to this interesting volume gives the reason for its publication as "a record of the amazing accomplishments of those pioneers of the electrical industry who, in the face of almost insurmountable difficulties, harnessed the gigantic force of electricity and put it to work to serve mankind."

More than three years were spent by the author in collecting the historical material for a volume written for the layman as well as the scientist, and it will be of interest to both.

Profusely illustrated, Men and Volts, tells of the transformation that has taken place within the span of two generations since the last horsecar disappeared and there came into full flower a new era—the electrical age. It is more than a mere recital of facts, because it deals with the human element of trials, of omissions and successes told oftentimes by those who had an important part in what was taking place. J. B. Lippincott Co., N. Y. 424 pages, $2.50.

W. K. (Ken) Ebel, chief engineer of Glenn L. Martin Co., and world famous as a test pilot, has been named vice-president in charge of engineering and a director of the Glenn L. Martin Co.

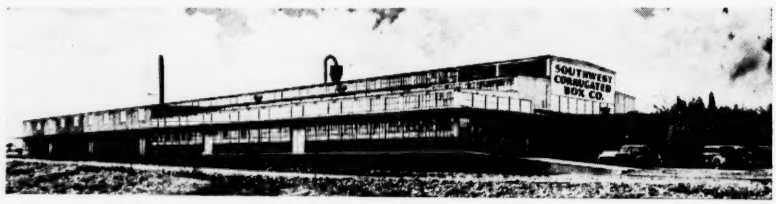
Hitherto responsible for the engineering, as well as the flight testing, of all of the Martin bombers for Army, Navy and British, Ebel now becomes an officer of the largest, as well as the oldest aircraft firm in the country.

Mr. Ebel will retain his old title of chief test pilot which he has held since he tested the Martin BM-2, progenitor of the modern dive-bombers, a decade ago.

As assistant chief engineer of the company, he had much to do with development of the China Clipper and her sister ships, first of the over-ocean air giants.

Produced under Mr. Ebel have been designs and developments of all of the current bomber types now being manufactured by Martin. These are the B-26 medium bomber for the Army; the PBM-1 flying boats, long-range patrol bombers for the Navy; the 167 "Maryland," an attack bomber for the British; the forthcoming 187 "Baltimore," a medium bomber for the British, and a mystery leviathan of the air for the Navy, said to be the largest flying boat in the world.

***The Southwest Corrugated Box Company plant with 67,000 square feet of space on the Frisco tracks in South Fort Worth, Texas, where corrugated fiber shipping containers are being manufactured. Equipment consists of a 76" Langston Corrugator with supplement equipment for complete fabricating consisting of a printer slotter, slitters, taping machines, stitching machines, die cut press, etc. This plant which began operations only a short time ago is supplying manufacturers of Texas and Louisiana with corrugated shipping containers.***




## Committee Appointed to Handle Defense Plant Sites

Appointment of a Plant Site Committee, Donald M. Nelson, chairman, to review and approve proposals for location by government agencies of additional plants or facilities required for national defense, has been authorized by the Office of Production Management.

In reviewing proposed plant locations from funds hereafter to become available under the new production program, the Committee will insofar as possible with primary emphasis on expediting defense production, and appropriate military factors, facilitate geographic decentralization of defense industries and full employment of all available labor.

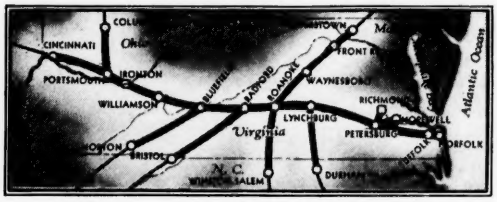
# "There's the Spot!"

THIS man is right. Hundreds of others have said the same thing. And they've been right. Here's the proof.

During the past ten years alone, 1,833 new industries and additions to plants (representing 94 distinctly different kinds of industries) have been established in the territory served by the Norfolk and Western Railway. That's an average of one every other day. And that's steady development . . . even during the darkest days of the depression. (The 1940 record shows the trend: 236 plants! $230,000,000 investment!)

And yet, the surface in this territory has hardly been scratched. For here is a land where there's plenty of room to grow; a territory rich in the essentials to sound industrial development—an abundance and variety of raw materials, intelligent native labor, a climate for year-around work, plenty of fuel and power, and quick access to the nation's greatest markets by precision railway transportation—East, West, North, and South.

The N. & W.'s Industrial and Agricultural Department at Roanoke, Va., can help you solve your problem of plant location. Write or call for confidential information.



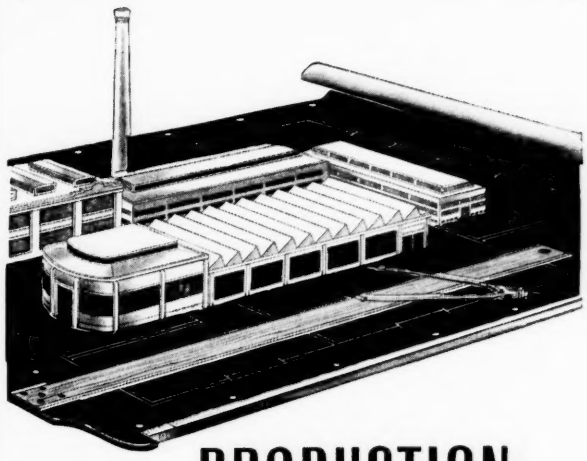

*The Territory of the*

**NORFOLK and WESTERN RAILWAY**

*for Better Plant Locations*



★ ★



# PRODUCTION

*starts at the drawing board*

The swift, smooth flow of production evolves from the considered analysis by the Engineer; is born on the drawing board and translated, under his stewardship, through the successive steps of location, layout, construction and erection of equipment—all achieved through the scheduled and synchronized flow of materials and work—an accomplishment that has its roots in training and experience.

For your new plants or extensions in this era of intensified production, you can call upon the four decades of experience of this firm of Engineers—an experience which includes a wide range of past and present defense work as well as industrial and commercial structures.

*Engineers*

**J. E. SIRRINE & COMPANY**

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INDUSTRIAL PLANTS · PLANS AND DESIGNS · POWER

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XUM

# American Gas Association Meeting

Two hundred members of the industrial and commercial gas section of the American Gas Association met last month in Baltimore, to discuss the latest in gas applications for industrial purposes and to exchange ideas for furthering sales.

Representatives came from all sections of the country and from Canada, and among them were 69 from Southern gas companies, including Carl Wolf, chairman of the meeting, and representing the Atlanta Gas Light Company; E. L. Stauffer, South Carolina Power Co., Charleston; E. T. Hatzenbeuhler, Lone Star Gas Co., Dallas; W. W. Addison, Consolidated Gas, Electric Light & Power Co., Baltimore; J. W. Ashby, Surface Combustion Corp., Baltimore; J. C. Ayers, Manufacturers Light & Heat Co., Wheeling, W. Va.; F. R. Baily, Bryant Air Conditioning Corp., Baltimore; E. J. Boothby, Washington Gas Light Co., Washington; R. H. Bussard, Alexandria Gas Co., Alexandria, Va.; H. R. Cook, Consolidated Gas, Electric Light & Power Co., Baltimore; J. P. Crabb, Consolidated Gas, Electric Light & Power Co., Baltimore; C. W. Ford, Rosslyn Gas Company, Arlington, Va.; G. E. May, New Orleans Public Service, Inc., New Orleans; M. F. Matzek, F. J. Evans Engineering Co., Birmingham; C. B. Melton, Hagerstown Gas Company, Hagerstown, Md.; I. M. Riles, Wheelco Instrument Company, Atlanta; W. F. Roberts, Standard Gas Equipment Corp., Baltimore; M. L. Sperry, Washington Gas Light Co., Washington.

Gas in national defense production was emphasized early in the conference when F. Coleman Starr, of Surface Combustion Corp., Philadelphia, described the furnaces being used in hardening shells, gun barrels and airplane engine blocks and pointed out that heavier guns, tanks, armor plate and ships are now requiring greater numbers of new furnaces with resulting increase in gas consumption.

During an informal discussion following Mr. Starr's paper, which featured furnace treatment of shells and guns for aerial warfare, Hale A. Clark, Michigan Consolidated Gas Company, Detroit, injected the possibility of utilizing gas for heat treating magnesium and aluminum, important metals in aircraft production. Twenty-five test bars of the highly inflammable metal have been heat treated through cooperation of Dow Chemical Co., and Aluminum Company of America was reported as investigating use of gas for a similar purpose in its aluminum operations.

Huge demands for heat through construction of new plants and rehabilitation of idle facilities under the national defense industrial expansion have resulted in increased sales of gas unit heaters, said W. N. Blinks, of General Gas Light Co., Kalamazoo, Mich. Temporary buildings are mushrooming, he said, and the structures are frequently located where gas heaters furnish a practical answer to the heating problem.

A report sponsored by the committee on industrial gas research was made by Carl P. Mann, of Selas Company, Philadelphia. Speaking on gas fuel for short cycle curing of industrial finishes, he said the fundamental fact in curing finishes is that the operation depends on heating the work piece and only in the degree that any curing process accomplishes this, will the process be successful.

Charles M. Cohn, executive vice president of Consolidated Gas, Electric Light & Power Co., Baltimore, utility which welcomed the delegates through R. H. Tillman, manager of its new business department, spoke at the first of two luncheons held during the convention. Mr. Cohn prefaced his address on "The Industrial Department's Responsibility to Management" with the observation that the meeting was the Section's first in Baltimore and its first in a city where manufactured gas predominates.

A message from Alexander Forward, managing director of the American Gas Association, lauded Baltimore as the city where the country's first gas company was established. "Baltimore," he said, "is the home of gas house heating as we know it today, and the Baltimore company has the distinction of having organized one of the first industrial gas departments in the country." He cautioned his listeners on installation of "subnormal gas furnaces, ovens and burners" such as occurred during the first World War.

## R. I. Ingalls Speaker at Mississippi Meeting

Mr. Robert I. Ingalls, President of the Ingalls Iron Works of Birmingham, and Chairman of the Board of the Ingalls Shipbuilding Corporation, Pascagoula, Mississippi, was the principal speaker at the annual meeting and banquet of the Washington County Chamber of Commerce, at Greenville, Miss.

This annual meeting of the Washington County Chamber of Commerce has become quite an event for Western Mississippi to which many distinguished guests come each year to hear matters of general interest to the whole state discussed. At the banquet in 1939, Mr. W. H. Mason, Vice-President of the Masonite Company at Laurel, delivered one of the most interesting addresses ever heard in the South on Chemurgy as the great factor in the future industrial development of the South. Last year the guest speaker at the banquet was Mr. J. L. Beven, President of the Illinois Central Railroad System, who was accompanied here by a number of his official family from Chicago, St. Louis and Memphis.

Among those invited to this year's meeting were Governor and Mrs. Paul Johnson of Mississippi, Governor and Mrs. Homer Adkins of Arkansas, and Governor and Mrs. Sam Jones of Louisiana. President Oscar Johnson of the National Cotton Council was present together with a large gathering of other people.

***Newest tanker of The Atlantic Refining Company fleet, the SS. E. H. Blum, is taken in tow by tugs after being launched at the Chester, Pa. yards of the Sun Shipbuilding and Dry Dock Co. The vessel will operate between Texas Gulf ports and Philadelphia. Of all-welded design, the new tanker has a cargo capacity of 154,000 barrels of crude oil, is powered with 5,000 horsepower turbo-electric engines, and has a sea speed of 13.25 knots.***

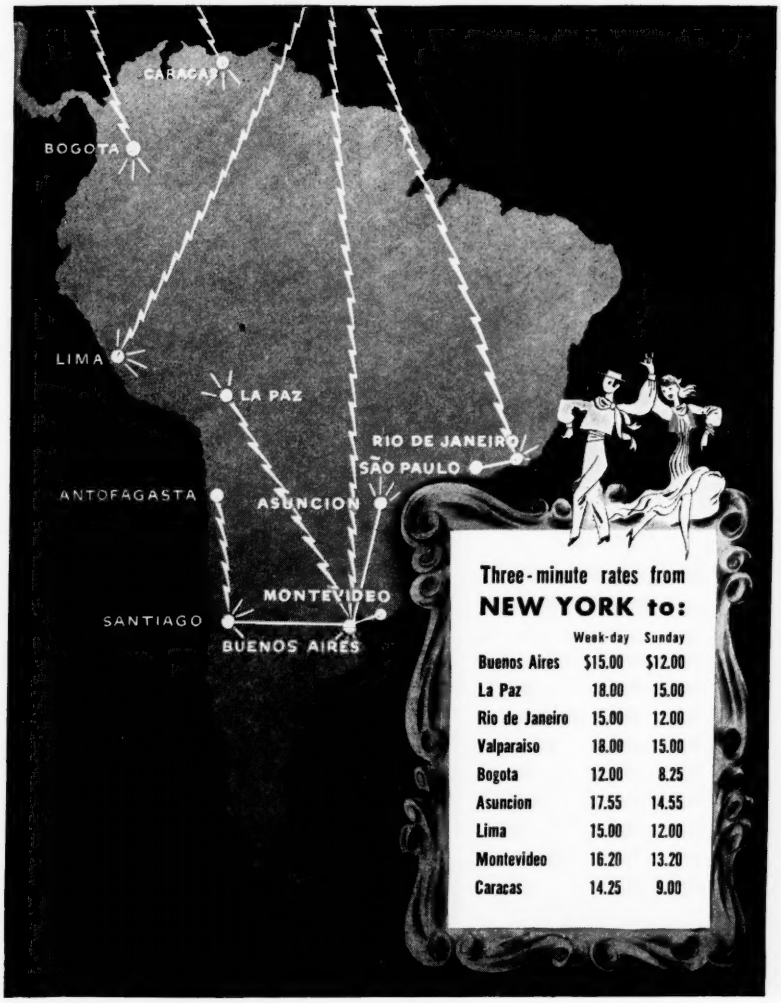
# There's a good neighbor right next door— *by telephone!*

THE great and growing interest in South America highlights the *value* of good telephone connections between the two continents.

Many American firms regularly depend on overseas telephone service. Others are fast discovering that it expedites deals and gets decisions when days and dollars count.

The map to the right shows the direct circuits to South America—from which most other points can be reached —and some rates.

Try the *only* service that puts you in quick, *personal* contact with friends or associates overseas. It's easy—just an extension of the Long Distance Service you use all the time.




**Three-minute rates from NEW YORK to:**

| | Week-day | Sunday |
|---|---|---|
| Buenos Aires | $15.00 | $12.00 |
| La Paz | 18.00 | 15.00 |
| Rio de Janeiro | 15.00 | 12.00 |
| Valparaiso | 18.00 | 15.00 |
| Bogota | 12.00 | 8.25 |
| Asuncion | 17.55 | 14.55 |
| Lima | 15.00 | 12.00 |
| Montevideo | 16.20 | 13.20 |
| Caracas | 14.25 | 9.00 |

**BELL SYSTEM OVERSEAS TELEPHONE SERVICE**

# New Methods and Equipment

## Steel Stools

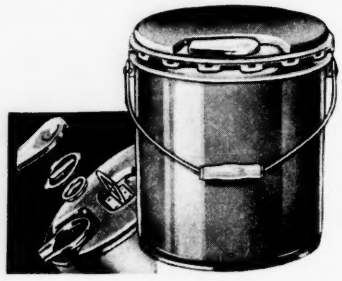
Covering a range of seven heights, from 18 inches to 30 inches in multiples of two inches, with 112 models available, a complete line of new steel stools has been introduced by Lyon Metal Products, Inc., Aurora, Ill. All models are built around an all-welded basic stool with forged steel, dome shaped feet and steel seat. To this stool may be added a pressed wood seat, adjustable steel back, rubber feet, and rubber feet with steel glides or casters. Most important of the exclusive Lyon features are all-welded, non-breakable construction, unusually large seat area—187 square inches on all heights, strong channel brace-foot rest a uniform distance

*Steel Stool 28 Inches High With Pressed Wood Seat and Adjustable Steel Back Attached*

below seat on all heights; round edge, steel band construction with no rough edges to tear or snag clothing, tapered legs to insure safety against tipping, and interchangeable accessories that may be attached at any time. Suitable for every industrial or commercial use, the steel construction and high grade baked enamel finish of the stools assure long life and continued attractive appearance. Green and brown are standard, with other colors available at slight extra cost.

## "Por-Pail" Sets New Design in Steel Containers

Offering an unusual combination of beauty, efficiency and strength at moderate cost, a new steel container has been developed by the Wilson-Bennett Manufacturing Company of Chicago, Ill. It is known as the R-Type "Por-Pail" and is available in 5- and 10-gallon sizes, suitable for use with paints, oils, syrups, chemicals, foodstuffs, etc. The unit reflects a streamlining influence that makes it attractive. The top and bottom heads are rounded, respectively, in convex and concave shape, so that the containers will nest one on top of another, and the rims are raised to create an interlocking effect when the containers are so stacked. In the 5-gallon size the container is available with either separate lug-type cover or with integral, seamed-on cover, while the 10-gallon size is available only in the



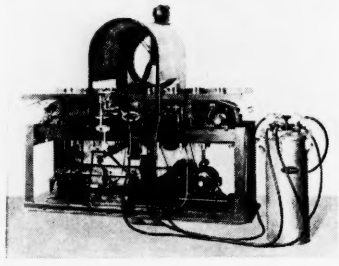
*R-Type "Por-Pail" Steel Container*

drum-type, with integral seamed-on cover. Three different pouring spouts may be had on the R-Type "Por-Pail," and it can be furnished plain, without finish, or it can be printed or lithographed in any desired fashion.

## Artillery Shell Sprayer

According to an announcement of the Eclipse Air Brush Co., Inc., Newark, N. J., they are making a fully automatic machine, as shown by the accompanying illustration, to spray coat the inside of projectiles.

The makers say it will spray the inside



*Automatic Machine to Spray the Inside of Shells*

of 155-mm. shells at the rate of 400 an hour, and the same type machine can be built to handle any size projectile or other cylindrical object.

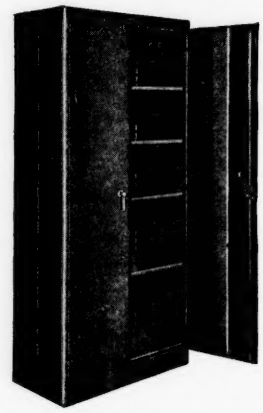
Full details of the machine and its operation are available from the manufacturer.

## New Corrugated Floor Runner

A new type of corrugated floor runner which is described as non-skid, resilient, waterproof and inexpensive, is now being marketed by The Philip Carey Company, Lockland, Cincinnati, Ohio, according to announcement. The product is available in rolls 36 inches wide and 30 feet long. It is a composition material with rubber-like appearance, and is ribbed to give a non-skid surface, suitable for use in halls and on floors of theatres, stores, offices, basements, recreation rooms, in model or demonstration homes, or on floors where an inexpensive and wear-resistant, protective covering is required. The runner is flat, is easily handled and provides a firm footing.

## New Steelart Storage and Wardrobe Cabinets

Representing a noteworthy advance in the design of storage and wardrobe cabinets, the new Steelart line, recently placed on the market by Lyon Metal Products, Incorporated, Aurora, Illinois, includes both double-door and single-door storage, wardrobe, and combination cabinets, and Desk-hi, Counter-hi, and janitors' cabinets. An outstanding fea-



*Streamlined Steelart Double-Door Storage Cabinet*

ture of the new cabinets is the streamlined, round-corner construction. Other features are: safety, because of no sharp corners or edges to catch clothing or cause accidents; smoothness, because surfaces are smooth and sleek to emphasize modern design; more cabinet space, because closed bases are only 4¾ inches high, while the doors open 180 degrees, allowing full capacity width for storage; tubular frame, grooved key lock, larger hinges, improved door stops, shelf reinforcement, hand adjustable shelves, etc. Standard finish for Steelart cabinets is Lyon Green baked-on quality enamel. Finishes are also available in white, grained walnut, grained oak, grained mahogany, walnutone, flat brown and flat gray.

## Moving Industry's Heavy Loads

(*Continued from page 32*)

finishing, it is often possible to group these operations together and handle the part from machine to machine by means of a jib crane. For example, one of the parts handled is a gear blank weighing about 300 pounds. This gear must be bored, then hobbed, and then finish-ground, and it must also receive a special heat-treatment. Separate machines are used for these finishing operations, and the gear is handled between machines by means of a jib crane, which can be manipulated by the same individual who operates the several machines. Hence, only one operator is required for this work. For transporting the gear between these machines and the heat-treating department, one of the overhead traveling cranes is more desirable than a lift truck.

The assembly points for the diesel engines, motors, and generators are serviced by wall bracket cranes, each provided with a hand chain hoist which rides the lower flange of the I-beam boom. The parts making up these assemblies are not very heavy nor difficult to handle, and therefore lifting and lowering by hand chain is satisfactory. Similar cranes are also used to handle work at some of the lathes.

For all crane hoist ropes and rope slings, this company specifies preformed rope of improved-plow-steel grade because of the high strength of this steel and the rope's inherent ease of handling. Although these crane ropes do not wear out rapidly and therefore rope replacements are not frequent, yet it is desirable to reduce the time the crane must be out of service for reroping to as short a period as feasible in order to guard against interference with production schedules. Preformed ropes do not tend to loop and kink when given slack, and they can be cut and handled without applying seizings to the ends since they have no tendency to ravel. Hence, they speed up the re-roping job and allow the crane to be put back into service more quickly than when non-preformed ropes are used.

The easy handling of preformed rope is also important in the case of slings. The natural tendency of non-preformed rope to twist often results in entangling the different parts of non-preformed slings, and valuable time is lost when the rigger must untwist these parts before hitching the sling to the load.

In the handling of crane loads in this plant, two types of rope slings are in common use: the bridle sling and the structural erector's sling. The latter has loops at both ends, while the bridle slings have two, three, and four legs, one end of each leg terminating in a hook, and

(*Continued on page 49*)

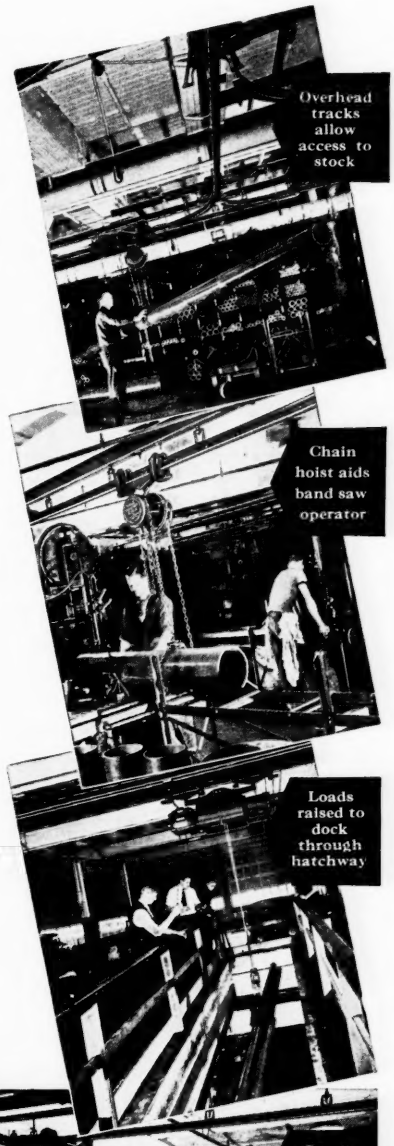

# From stock to dock!

When it comes to bottlenecks these days our experience proves that the shipping department is the place that takes a real beating. Pictures here show how stock can move quickly from storage to trucks without congestion.

The extreme flexibility of American MonoRail equipment enables engineers to design such a system, related throughout the plant yet providing constant individual service at each process.

American MonoRail engineers, located in every industrial center, will gladly suggest from their wide experience a solution to your particular problem.

*Write for copy of Blue Book illustrating hundreds of overhead monorail installations.*



THE AMERICAN MONORAIL COMPANY

13118 ATHENS AVENUE, CLEVELAND, OHIO

# This Galvanized Metal

The architect for this restaurant wanted "an acoustical ceiling of painted galvanized metal." Naturally he wanted it to stay attractive a long time.

Only a few years ago an order like this went on the "uncertain" list. But here the architect and the owner were sure. They specified ARMCO Galvanized PAINTGRIP.

More than 400 field tests show that paint on ARMCO PAINTGRIP sheets lasts *at least 150% longer* than paint on ordinary galvanized metal. And 200 manufacturers of paints and enamels have approved PAINTGRIP as an especially suitable base metal for their products.

When you use this special bonderized metal your products have the full protection of a good zinc coating, plus the extra protection and beauty of paint. Acid etching or primers are not needed.

Would *your* products be more saleable made of Bonderized ARMCO Galvanized PAINTGRIP sheets? Write for a working sample. The American Rolling Mill Company, 1261 Curtis Street, Middletown, Ohio.

ARMCO

## ARMCO PAINTGRIP SHEETS

# CUT ROOF MAINTENANCE COSTS With Careyclad COATING

Careyclad wears 100% longer than ordinary roof coatings because it is made under an exclusive Carey formula, combining the finest "High-Melting" asphalts with specific "Anti-Aging" chemical compounds. Specially graded asbestos fibres from our own mines give additional strength.

Careyclad Coating is not subject to hair-cracking, alligatoring, pinhole formation, slipping or sliding. Will not ball or roll up under brush. Highly resistant to the disintegrating action of the ultra-violet rays of the sun. Gives *both* longer protection and greater economy.

Careyclad is satisfactory for many different types of roofs, including metal. Write Dept. 61 for details.

THE PHILIP CAREY COMPANY • Lockland, Cincinnati, Ohio
Dependable Products Since 1873
IN CANADA: THE PHILIP CAREY COMPANY, LTD. Office and Factory: LENNOXVILLE, P. Q.

# What other water pipe has all these advantages?

MORE THAN 11 MILES of Transite Pipe used on this industrial water line.

Wherever Transite Pipe is used for industrial water lines, its asbestos-cement composition provides these important benefits:

1. CUTS INSTALLATION COSTS
2. MINIMIZES UPKEEP
3. MAINTAINS HIGH DELIVERY CAPACITY
4. HELPS ASSURE CLEAN WATER

Before you install new water lines or extensions on existing ones, get the facts on Transite Pipe. Write for brochure TR-11A. Johns-Manville, 22 East 40th Street, New York, N. Y.

JM Johns-Manville
## TRANSITE PIPE
*For efficient, economical industrial water lines*

## Moving Industry's Heavy Loads

(*Continued from page* 47)

the other ends attached to a steel ring by means of thimbles. Special types of slings are used for the locomotive bodies and for stacks of plates.

In addition to rope slings, many chain slings also are used. These chains are annealed every three or four months, or whenever the surface takes on a brightness that indicates work-hardening.

Wherever possible, hooks or eyes are provided as an integral part of the load to insure positive attachment with the crane hook and promote safety. For example, eyelets are cast integral with the traction-motor frame to permit attachment to the sling hooks. Also, every Diesel engine is provided with two hooks securely welded to the engine frame. The rotors of all electrical machines are handled by means of eyes attached to caps that are screwed onto the threaded end of the rotor shaft.

Too great care cannot be exercised in attaching crane slings to loads. Carelessness in this regard exposes workmen to injury, to say nothing of the possibility of damage to the load itself. The management of this plant places such importance on this matter that, on many kinds of loads, slings are allowed to be attached and handled only by riggers—men who have been specially trained in hooking loads.

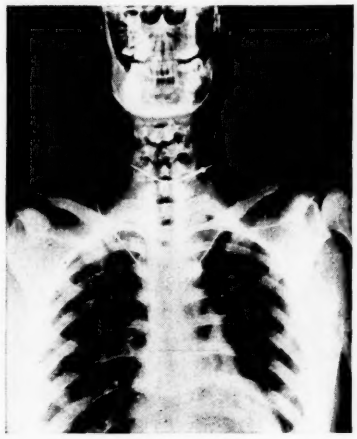
The locomotives made in this plant are of two types—the streamlined passenger locomotive, and the freight locomotive used for terminal switching. The final assembly consists of setting the body onto the trucks, then installing the engine and electrical equipment. The completed locomotive is moved out of the assembly bay on tracks and taken to the painting department and then to the inspection department, after which it is ready for delivery.

The setting up and maintaining of production schedules requires careful consideration to methods of handling parts and materials. Where parts to be transported vary from small pieces to tremendously heavy assemblies, some with finished surfaces or provided with delicate parts such as commutators and wiring, it is this plant's experience that routing of work and methods of handling take on great importance in an effort to keep down costs, make the most efficient use of production equipment, meet delivery dates, and protect workmen as well as parts against injury.

The management of this locomotive plant place safety considerations foremost, and to this end they see that equipment, ropes, slings, chains, and methods of handling are such as to insure against hazards to men and equipment.


# *Let's Look At An* X-RAY PICTURE

## *by Westinghouse*



• *This is* an x-ray picture. It isn't half as exciting as the pictures you see at the movies or those you make yourself. But for sheer importance, x-ray pictures top them all.

• *The design* and manufacture of the equipment that makes these x-ray pictures is one of the most interesting and exacting branches of our business. One of the reasons is its variety, for today, both industry and the medical profession make many uses of x-rays. Most equipment must be specially engineered. With the exception of a few models, it's the kind of business that can't be catalogued.

• *Here are some* of the ways that x-rays serve today. Armor plate may look flawless on the surface, but still have treacherous, weak spots inside. So, x-rays are flashed through inches of steel, because in the Navy Yards they refuse to guess on the toughness of a battleship's hide.

• *In the foundry*, x-rays are used to inspect castings. Welds on pressure vessels that must hold hundreds of pounds of live steam are checked with x-rays. Scientists in the laboratory look inside of bugs and plants and textiles with x-rays. Museums x-ray doubtful portraits to see if there's another sketch beneath the "old master."

• *But,* much more important than any of these, is the day-by-day job of x-rays in preserving health and curing disease. The army makes x-ray pictures of chests of the men it calls into service. Health authorities send traveling x-ray equipment, even into the remotest districts, to examine school children.

• *In many of* the country's great industries everybody—from the president to the apprentice—is x-rayed to make sure that he is physically fit for his job.

• *You'll find it* an interesting experience to talk to a roentgenologist—a physician who specializes in this fascinating branch of medicine. Ask him to let you look at a radiograph—an x-ray picture. It may seem just a blur of grays and whites and blacks. But he can read those strange shadows cast by invisible light on a photographic film and show you how they make it possible to recognize tuberculosis and many other diseases early enough for treatment to be really effective. And he'll explain to you how those same x-rays can often cure cancer that once would have been declared hopeless.

• *X-rays serve* an almost unbelievable variety of purposes. So it is only to be expected that at our Long Island City, N. Y. plant, where x-ray apparatus is built, you will find a surprising variety of equipment. We at Westinghouse enjoy working in this field, because its many problems offer a constant challenge to research and engineering.

*More than likely there's a Westinghouse X-Ray Office in your city, or very near-by. You'll find it listed in the classified section of the telephone directory. If these men can be of service to you, feel free to call upon them any time. Headquarters address is: Westinghouse X-Ray Division, Long Island City, New York.*




XUM

# Industrial News

## Seamless Steel Tube Institute Launches Market Research Program

Adopting a program of market research and related activities, The Seamless Steel Tube Institute, Pittsburgh, Pa., announces that the program was put into effect March 1 under the direction of W. A. Cather, now advertising manager of the Babcock & Wilcox Company, New York City. In his new position, Mr. Cather will operate out of the Institute's offices at 3510 Gulf Building, Pittsburgh, and the offices of the Michel-Cather organization at 2 Park Avenue, New York.

## Cochrane Corporation Appointments

W. W. Tomes has been appointed head of the Flow Meter Section of the Cochrane Corporation, Philadelphia, Pa., according to W. C. Bennett, Appliance Division Sales Manager. A graduate of Purdue University in 1928, Mr. Tomes has been associated with the Firestone Tire and Rubber Company in flow measurement and steam distribution work, and more recently in meter field engineering and sales work. Assisting Mr. Tomes will be W. C. Morrison, lately associated with the Brooklyn Union Gas Company as a sales engineer. Mr. Morrison attended the University of North Carolina and graduated from Brooklyn Polytechnic in 1936.

## Westinghouse Man Joins National Defense Commission

According to a recent announcement of George H. Bucher, president of Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., M. L. Fawcett of Pittsburgh, associated with the company for 42 years, has been granted leave of absence to join the staff of the National Defense Commission in Washington. This is in response to a request of William S. Knudsen, director of the Office of Production Management. Mr. Fawcett began his duties in Washington early in February. Prior to that time he had served as staff assistant to T. I. Phillips, assistant to the president, in charge of works management for Westinghouse. Mr. Fawcett was born at Centerville, Md., and was educated in the public schools of Dover and Wilmington in Delaware.

## Hercules Powder Executives

Edward B. Morrow, assistant treasurer of Hercules Powder Company, Wilmington, Delaware, has been elected treasurer and a member of the Executive Committee, succeeding Charles C. Hoopes, according to announcement by Charles A. Higgins, president. Mr. Hoopes will continue active in the affairs of the company as a director and member of the finance Committee. Francis J. Kennerley, comptroller, was elected an assistant treasurer, but will continue as comptroller. Other officers were reelected for the ensuing year. Mr. Hoopes has been associated with the company since its organization in 1913, while Mr. Morrow joined it in 1916, beginning his work in the Explosive Sales Department. Mr. Kennerley has been employed by the company since its incorporation in the auditing and accounting divisions. He has been comptroller since 1926.

## Chicago Bridge and Iron Tanks for Southern Installation

Recent units built by Chicago Bridge and Iron Company for Southern installation include: a 100-inch inside diameter by 150-foot long creosoting retort for the International Creosoting and Construction Company for shipment to Beaumont, Texas. This vessel is of welded construction and was stress relieved by first placing one end in the stress relieving furnace and then the other. It was built in the company's Birmingham plant.

Other units are six 12-foot diameter by 42-foot pressure tanks and nine 20-inch diameter by 16-foot, 6-inch high water columns, built for the La Gloria Corporation at Falfurrias, Texas. The pressure tanks are used for the storage of butane under 75 pounds working pressure.

## Strube Now Link-Belt Eastern Division Chief Engineer

Link-Belt Company, Chicago, Ill., announces the appointment of Harry L. Strube as chief engineer of the Link-Belt Eastern division, with headquarters at the company's Philadelphia plant, to succeed F. F. (Ferd) Waechter who resigned after 43 years of service. Beginning his service with Link-Belt in 1898 in the company's Philadelphia plant engineering department, Mr. Waechter has served in various capacities in both the Chicago and Philadelphia plants, and was made assistant chief engineer in 1934.

## New Southern Goodrich Distributors

The following new Southern distributors have signed agreements to handle the mechanical goods line of The B. F. Goodrich Company, Akron, Ohio, according to announcement by Vice President J. H. Connors, in charge of mechanical division sales: Industrial Service Company, Decatur, Ga.; Transmission Supply Company, St. Louis, Mo.; Lovett & Tharpe Hardware Company, Dublin, Ga., and Industrial Rubber Products Company, Wheeling, W. Va.

## Buda Company Washington Office

The Buda Company, Harvey, Ill., announces the opening of an office and display floor in Washington, D. C., at 1469 Church Street, between 14th and 15th Streets, Northwest. The office will be in charge of Col. H. H. Frost, Vice President.

## Madison and St. Louis Car Plants Under One Management

The American Car and Foundry Company, New York City, announces that the Madison and St. Louis car plants have been combined under one management, and that Thomas A. Dooley has been appointed District Manager in charge of both plants, with Norman H. Shipley acting as Assistant District Manager of the Madison plant. Stephen S. Eagle has retired as District Manager at his own request.

## Iron and Steel Products Washington Office

Iron and Steel Products, Inc., Chicago, Ill., (Hegewisch Station) announces the opening of a branch office in the American Security Building, Washington, D. C., in charge of Ernest W. Smoot, Vice President.

## Hutton Named Works Manager of Robins Conveying Belt Plant

According to announcement by Thomas Matchett, President of the Robins Conveying Belt Company, Passaic, N. J., Andrew Hutton has been appointed Works Manager of the company's Passaic plant and is in charge of all manufacturing operations, buildings and equipment. Mr. Hutton was recently chief engineer of the Davis Engineering Corporation, Elizabeth, N. J., and prior to that was vice president and general manager of the Taylor Manufacturing Corporation, Milwaukee, Wis. He is a member of the Institution of Naval Architects of London, England, a Whitworth exhibitioner with bronze medal in technology, and a senior member of the Society of Industrial Engineers of America.


**WASHINGTON REPRESENTATION**

**From simple inquiries to volume contracts the firm is gainfully serving its purposely few industrial accounts.**

**Washington and New York offices. The expected endorsements. Can now represent three additional accounts.**

**If undisclosed identity preferred, your bank or counsel could make preliminary inquiries.**

**Box No. 9486**
**Manufacturers Record**
**Baltimore, Md.**

While cosmopolitan in its general appeal, and modern *up to this moment* in its equipment, there is a peculiar flavor of The Old South here which Southerners are quick to note and appreciate. They feel at home and come back to us again and again.

*Rates* $3.00 *per day and up. Every room with bath or shower. Centrally located.*

The Southern Hotel
BALTIMORE



*We have helped*

many businesses that have brought us their financial problems.

*Correspondence invited.*

BALTIMORE COMMERCIAL BANK

GWYNN CROWTHER, *President*

BALTIMORE, MARYLAND

Member Federal Reserve System
Member Federal Deposit Insurance Corporation

# INDUSTRIALLY ACTIVE RICHMOND

The many new industries which have come to Richmond in the last few years are tangible evidence of the city's attractiveness and worth as a manufacturing center. Improved port facilities, exceptional rail and air transportation lines and an unsurpassed highway system are among the many contributing factors.

Ever since 1865, First and Merchants has been closely and actively engaged in banking for manufacturing enterprises in various parts of the South. If you are seeking a new location for your factory or have in mind the establishment of an additional plant, First and Merchants will be glad to assist you in obtaining reliable information and to consider financing the expansion of valuable industries.

**FIRST AND MERCHANTS**
**National Bank of Richmond**

John M. Miller, Jr., Chairman of the Board • H. Hiter Harris, President

CAPITAL AND SURPLUS SIX MILLION DOLLARS

Member Federal Deposit Insurance Corporation

## YORK SAFE & LOCK CO.

*Manufacturers of*

OUT-OF-SIGHT DOOR SAFES
A AND B LABEL SAFES
TWO HOUR CERTIFIED SAFES
ONE HOUR SAFES
WALL SAFES
FIRE RESISTIVE VAULT DOORS
BURGLARY RESISTIVE CHESTS
BANK AND SAFE DEPOSIT VAULT DOORS
SECURITY LOCKERS, SAFE DEPOSIT BOXES
BANK VAULT EQUIPMENT

•

*Factory and Principal Office*

**YORK, PENNA.**
Baltimore Branch—7 W. Redwood St.
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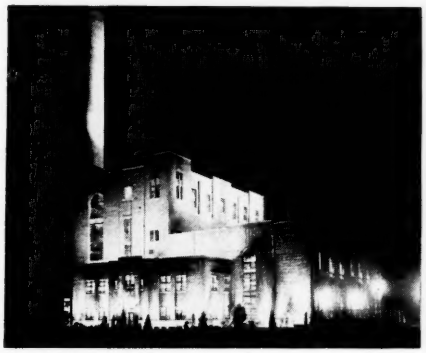
*Branches in All Principal Cities*

Manufacturers and Builders of the World's Greatest Vaults

## DESIGNERS ENGINEERS



*Fabricators of*

**STRUCTURAL STEEL BUILDINGS**
**BRIDGES—TANKS—BARGES**
**PASSENGER and CARGO VESSELS**

*—Five Plants—*

**The Ingalls Iron Works Co.**

Birmingham, New York (1 E. 42nd St.), Atlanta, Pittsburgh and New Orleans

*Address:* **Birmingham, Alabama**

CONSIDER

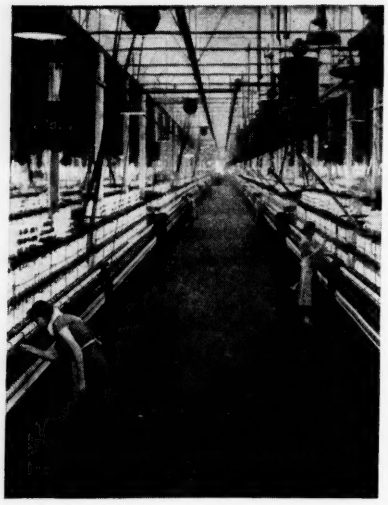
# Maple Floors

FOR

## GREATER EFFICIENCY

Workers' comfort goes hand-in-hand with efficiency. Smooth Hard Maple Flooring is a *comfortable* floor that's also long-wearing. It is warm and dry—prevents loss of body warmth through conduction—resilient, it holds off fatigue, thereby cutting down the accidents and mistakes that occur because workers are tired.

Because Hard Maple Flooring keeps efficiency up and keeps costs down, (it's easy to clean and to truck over, inexpensive to maintain, and remarkably long-wearing) it's being used today in even heaviest-duty plants.



Consider worker's comfort and efficiency next time you floor. Investigate **MFMA** Northern Hard Maple—in strips or blocks—Ask your architect.

**MAPLE FLOORING MANUFACTURERS ASSOCIATION**

**1797 McCormick Building, Chicago, Ill.**

Floor *with* **MFMA** Maple

REG. U. S. PAT. OFF.

(NORTHERN HARD)



The PERFECT ANSWER.. under present conditions

***IT'S YOURS*** *. . . a 32 page book that tells you how permanently and quickly you may erect the building you need, at lowest cost per square foot of floor space! Write today or see our full page advertisement in Sweet's Catalog. MARYLAND METAL BUILDING CO., Baltimore, Maryland.*

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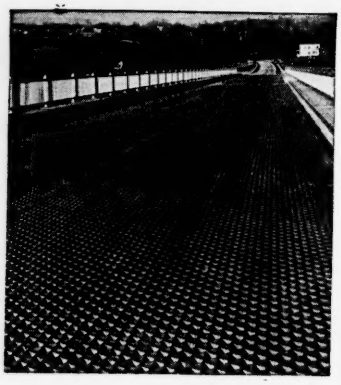

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# Trade Literature

**PARKWAY CABLES—**
Catalog J-862—"Roebling Parkway Cables—Metallic and Non-Metallic," 16 pages, illustrating and describing this Roebling product which finds a wide field of industrial application.
**John A. Roebling's Sons Company,** Trenton, N. J.

**SHOP EQUIPMENT—**
Catalog 184—illustrating and describing All-Steel-Equip shop equipment—production aids to modern methods in material handling—for industrial plants and other service.
**All-Steel-Equip Company, Incorporated,** Aurora, Ill.

**MATERIAL HANDLING EQUIPMENT—**
Circular No. 120—illustrates and briefly describes Lyon material handling equipment, most of which is hydraulic; separate literature available on the various products shown on the circular.
**Lyon Iron Works,** Greene, N. Y.

**MOTORS AND GENERATORS—**
Leaflet B-6131—illustrating and describing the Allis-Chalmers Lo-Maintenance Type E, direct current motors and generators for ratings up to 200 horsepower and 150 kilowatts.
**Allis-Chalmers Manufacturing Company,** Milwaukee, Wis.

**ELEVATED WATER TANKS—**
Bulletin—"Radial-Cone Bottom Elevated Water Tanks," illustrating and describing both structural and cylindrical column installations ranging from 125,000 to 2,000,000 gallons capacity; illustrations in publication are so arranged as to compare different construction features.
**Chicago Bridge & Iron Company,** Chicago, Ill.

**GAS-FIRED UNIT HEATERS—**
Catalog U41—illustrating and describing the new line of Reznor gas-fired unit heaters, including fan type, blower type and duct type, each available in five different capacities ranging from an input of 55,000 btu per hour and an input of 200,000 btu per hour.
**Reznor Manufacturing Company,** Mercer, Pa.

**PRINCIPLES OF METALLIC TRACTION—**
Graham Manual—Principles of metallic traction, with explanatory curves and diagrams, are set forth for the first time in Manual No. 501, which includes a description of the reversing feature, available on some Graham variable speed transmissions; publication also summarizes the applications of various types of variable speed transmissions, and tells when and when not to use a unit of the Graham type.
**Graham Transmissions, Inc.,** Milwaukee, Wis.

**AIR-CONTROL SHOVELS, DRAGLINES, CRANES—**
Catalog No. 4102—illustrating and describing Type 80, Model 800 Air-Control shovels, draglines and cranes, setting forth how the model is built, how Air-Control works, and shows why Air-Control is so important in modern excavating machinery.
**The Osgood Company,** Marion, Ohio.

**FOUNDRY EQUIPMENT, ETC.—**
Bulletin—"The Whiting Founder," office publication, winter edition, featuring an article on cupola operation;
Leaflet No. T-103—illustrating and describing the Junior Hydro-Blast Barrel, a new small size unit developed especially for use in medium and small brass foundries;
Leaflet No. 406—illustrating and describing new bottom door hoists for cupolas;
Bulletin CW-C-400—illustrating and describing the new improved Whiting bus and car washers, and electric turntables.
**Whiting Corporation,** Harvey, Ill.

**STEEL VALVES—**
Catalog No. 332—illustrating and describing Reading cast steel valves and cast steel fittings, with interesting illustrations of the design, materials testing and research activities, etc. in the plant at Reading, together with engineering data applying to the selection and installation of these valves and fittings.
**Reading-Pratt & Cady Division of American Chain & Cable Company, Inc.,** Reading, Pa.

**FLUORESCENT LAMP BALLAST—**
Catalog—covering the entire line of 62 types and sizes of Acme Lamp Ballasts now available for fluorescent lamp application.
**The Acme Electric and Manufacturing Company,** Cuba, N. Y.

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| Age at Issue | First 3 years (Guaranteed) | 4th and later years (before deducting dividend) | 4th Year Net Payment (1941 dividend scale, *used solely for illustration*; see below) |
|---|---|---|---|
| 20 | $69.20 | $81.40 | $66.40 |
| 25 | 79.10 | 93.05 | 76.60 |
| 30 | 91.75 | 107.95 | 89.55 |
| 35 | 108.55 | 127.70 | 106.40 |
| 40 | 130.90 | 154.00 | 128.50 |
| 45 | 160.60 | 188.95 | 157.40 |
| 50 | 199.85 | 235.10 | 194.95 |

Dividend at end of 3rd year may be used to reduce 4th year premium. Last column shows net payment on this basis, under our 1941 dividend scale. This figure is not guaranteed for the future but is given to illustrate the principle which applies. Dividends from year to year will depend entirely on future experience.

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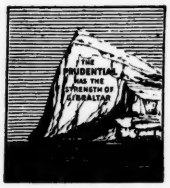


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**FREE!**

INDUSTRIAL DEPARTMENT **SEABOARD** AIR LINE RAILWAY

# National Defense Program Awards

(*Continued from page* 31)

## MISSISSIPPI (Continued)

### CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15

**Quartermaster Corps (Army)**

**The Alden Mills,** Meridian, 400,000 prs. woolen socks, $93,450.
**Hunter-Thomas, Inc.,** Tupelo, 30,000 khaki cotton shirts, $14,776.
**Lebanon Shirt Company,** Union, 150,000 khaki cotton shirts, $75,000.
**N. & W. Overall Company,** Jackson, 2,400 khaki cotton shirts, $3,900.
**Stahl Urban Company,** Brookhaven, 50,000 khaki cotton trousers, $34,500.
**Picayune Shirt Factory,** Picayune, 201,000 Jean khaki cotton shirts, $90,450.

## MISSOURI

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $321,715,139 |
| Navy Contracts | 5,412,908 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 900,762 |
| Federal Security Agency | |
| Office of Education Defense Training | 421,177 |
| Federal Loan Agency | |
| Defense Plant Corporation | 13,967,867 |
| Reconstruction Finance Corporation | 133,555 |

### CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15

**Quartermaster Corps (Army)**

**Miller Manufacturing Co., Inc.,** Joplin, 60,000 khaki cotton shirts, $29,976.
**Oberman & Company,** Jefferson City Springfield, 144,000 khaki cotton trousers, $98,147.
**Ely & Walker Dry Goods Co.,** St. Louis, 120,000 khaki cotton trousers, $82,800.
**Neevel Manufacturing Co.,** Kansas City, 17,750 trunk lockers, $49,345.
**Oberman & Company,** Springfield, 150,000 khaki cotton shirts, $78,000.
**Rice-Stix Dry Goods Co.,** Slater, 450,000 drawers, cotton shorts, $130,875.
**Goodenow Textiles Co.,** Kansas City, 250,000 drawers, cotton shorts, $76,750.
**J. A. Lamy Mfg. Company,** Sedalia, 50,000 khaki cotton trousers, $34,983.
**Burlington Mfg. Co.,** Kansas City, 48,000 one-piece working suits, $55,080.
**International Shoe Co.,** St. Louis, 240,000 prs. service shoes, $782,400.
**Brown Shoe Co., Inc.,** St. Louis, 240,000 prs. service shoes, $811,200.
**Carnie-Gouldie Mfg. Co.,** Kansas City, 3,000 pyramidal tents, $33,540.
**Baker-Lockwood Mfg. Co.,** Kansas City, 800 pyramidal tents, $10,832.
**Correct Cap Company,** St. Louis, 30,000 Khaki cotton field hats, $19,500.
**Union Cap Co.,** St. Louis, 25,000 Khaki cotton field hats, $16,250.
**Baker-Lockwood Mfg. Co.,** Kansas City, pyramidal tents, $57,500.
**Uniform Lettering Works, Inc.** St. Louis, 54,477 yds. woolen service chevron sleeve insignia, $4,358.
**Sun Manufacturing Co.,** St. Joseph, 50,000 Khaki cotton shirts, $26,000.
**Industrial Aid for the Blind,** St. Louis, 3,000 bleached cotton pillowcases, $645.
**Kansas City Cap Manufacturing Co.,** Kansas City, 40,000 Cotton field hats, $19,404.
**Morose Cap Company,** St. Louis, 65,000 Cotton field hats, $42,250.
**Continental Hat & Cap Co.,** Kansas City, 300,000 Cotton field hats, $163,000.
**Society Brand Hat Co.,** St. Louis, 35,000 Cotton field hats, $22,750.
**Premium Cap Company,** St. Louis, 80,000 Cotton field hats, $52,000.
**Shapely Cap Company, Inc.,** St. Louis, 25,000 Cotton field hats, $16,250.

**Ordnance (Army)**

**Metal Goods Corp.,** St. Louis, Brass, $7,876.
**Atlas Powder Company,** Atlas, Explosive, $168,480.
**National Lead Company,** St. Louis, Litharge & Lead, $1,090.
**Hardware & Supply Corp.,** Kansas City, Pick handles, $2,059.

**Medical Corps (Army)**

**Buck X-Ograph Company,** St. Louis, X-Ray field units, $4,768.
**Buck X-Ograph Company,** St. Louis, Developing units, $2,025.
**Buck X-Ograph Company,** St. Louis, X-Ray Supplies, $47,172.
**Shillington Box & Lumber Co.,** St. Louis, Box shooks, $13,581.
**Southern Equipment Co.,** St. Louis, Vegetable steamer, $844.
**Southern Equipment Co.,** St. Louis, Tray service trucks, $48,235.

**Marine Corps (Navy)**

**Columbian Steel Tank Co., Kansas City,** Storage tanks, $11,339.

**Supplies & Accounts (Navy)**

**Columbian Steel Tank Co.,** Kansas City, Mooring buoys, $91,672.
**Battenfeld Grease & Oil Corp.,** Kansas City, Lubricating grease, $11,650.
**Curtis Manufacturing Company,** St. Louis, Compressors, $241.

**Air Corps (Army)**

**Aircraft Accessories Corp., Siebenthaler Division,** Kansas City, Assemblies, $117,845.
**The H. D. Lee Mercantile Co.,** Kansas City, Flying suits, $160,490.

**Defense Plant Corporation (Fla.)**

**McDonnell Aircraft Corp.,** St. Louis, Construction of a building and equipment for the manufacture of tail surfaces and other airplane parts, $496,717.

## NORTH CAROLINA

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $44,186,095 |
| Navy Contracts | 1,351,095 |
| U. S. Maritime Commission Emergency Ship Program | 5,140,000 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 2,549,321 |
| U. S. H. A. Defense Housing Projects | ..... |
| Public Buildings Administration | 1,543,000 |
| Federal Security Agency | |
| Office of Education Defense Training | 510,282 |
| Federal Loan Agency | |
| Reconstruction Finance Corporation | 5,164 |

### CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15

**Quartermaster Corps (Army)**

**Mt. Airy Knitting Co.,** Mt. Airy, 40,000 Winter drawers, $36,708.
**Washington Mills Co.,** Mayodan, 78,000 prs. winter drawers, $70,980.
**Guilford Hosiery Mills, Inc.,** High Point, 275,000 woolen socks, $66,750.
**Waldensian Hosiery Mills,** Hickory, 60,000 prs. woolen socks, $14,550.
**Amos Hosiery Mills,** High Point, 500,000 prs. woolen socks, $119,350.
**Cramerton Mill, Inc.,** Cramerton, 12,689¼ yds. khaki cotton cloth, $5,695.
**Washington Mills Co.,** Mayodan, 300,000 cotton undershirts, $50,360.
**Quality Mills,** Mt. Airy, 120,000 cotton undershirts, $19,884.
**Cone Export & Commission Co.,** Greensboro, 350,000 yds. herringbone cotton twill cloth, $103,740.
**Beaver Shirt Mfg. Co.,** Moorehead City, 50,000 Khaki cotton shirts, $25,750.
**Charlotte Workshop for the Blind,** Charlotte, 12,000 Bleached cotton pillowcases, $2,580.

**Supplies & Accounts (Navy)**

**Manteo Boatbuilding Co.,** Manteo, Dinghies boats, $9,960.
**Chatham Manufacturing Co.,** Elkin, White wool blankets, $440,300.
**Granite Falls Mfg. Co.,** Hickory, White cotton-twine, $94,620.

## OKLAHOMA

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $17,582,295 |
| Navy Contracts | 1,859,881 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 3,024,696 |
| U. S. H. A. Defense Housing Projects | ..... |
| Public Buildings Administration | 465,500 |
| Federal Security Agency | |
| Office of Education Defense Training | 481,451 |

### CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15

**Quartermaster Corps (Army)**

**Oklahoma Clothing Manufacturers, Inc.,** Chickasha, 25,000 Khaki cotton trousers, $17,581.

**Corps of Engineers (Army)**

**Muskogee Iron Works,** Muskogee, Fabricated structural steel, $343,490.
**Consolidated Aircraft Corp.,** San Diego, California, Consultant services in connection with construction of aircraft assembly plants at Fort Worth, Tex. and Tulsa, $297,800, arbitrarily apportioned $148,900.

## SOUTH CAROLINA

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $22,757,689 |
| Navy Contracts | 119,357,303 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 2,820,511 |
| U. S. H. A. Defense Housing Projects | 1,181,273 |
| Public Buildings Administration | 1,059,000 |
| Federal Security Agency | |
| Office of Education Defense Training | 413,836 |
| Federal Loan Agency | |
| Reconstruction Finance Corporation | 5,164 |

### CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15

**Quartermaster Corps (Army)**

**Pacific Mills,** Lyman, 100,000 yds. herringbone cotton twill cloth, $29,940.
**Nantex Manufacturing Co.,** Greenwood, 20,000 yds. mosquito bars, $13,765.
**Piedmont Shirt Company,** Greenville, 58,000 Khaki cotton shirts, $30,160.
**Excel Hosiery Mills,** Union, 240,000 prs. woolen socks, $59,100.
**Chicago Bridge & Iron Co.,** Chicago, Ill., Steel water tank at Fort Jackson, $9,900.
**Dixie Shirt Co., Inc.,** Spartanburg, 250,000 Khaki cotton shirts, $123,750.
**Nantex Manufacturing Co.,** Greenwood, 8,000 Mosquito bars, $5,786.
**Nantex Manufacturing Co.,** Greenwood, 600,000 Drawers, cotton shorts, $172,009.

**Yards & Docks (Navy)**

**Pittsburgh-Des Moines Steel Co.,** Neville Island Sta., Pittsburgh, Pa., For pontoon gear at the Navy Yard, Charleston, estimated cost $56,100.

## TENNESSEE

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $55,701,905 |
| Navy Contracts | 372,046 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 433,530 |
| Federal Security Agency | |
| Office of Education Defense Training | 607,911 |
| Federal Loan Agency | |
| Reconstruction Finance Corporation | 10,294 |

### CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15

**Quartermaster Corps (Army)**

**Margate Hosiery Mills,** Chattanooga, 125,000 prs. woolen socks, $29,875.
**May Hosiery Mills,** Nashville, 450,000 prs. woolen socks, $107,130.
**Southeastern Shirt Corp.,** LaFollette, 100,000 Khaki cotton shirts, $48,755.
**Fly Manufacturing Co.,** Shelbyville, 25,000 Khaki cotton trousers, $17,250.
**Stein-Way Clothing Co.,** Erwin, 75,000 Khaki cotton trousers, $52,500.
**O'Bryan Bros., Inc.,** Nashville, 100,000 Khaki cotton trousers, $70,000.
**Robinson Manufacturing Co.,** Dayton, 50,000 Drawers, cotton shorts, $15,312.
**Salant & Salant, Inc.,** Lawrenceburg, 185,000 Khaki cotton shirts, $96,200.
**Nashville Tent & Awning Company,** Nashville, Pyramidal tents, $16,450.
**Knoxville Awning, Tent & Tarpaulin Co., Inc.,** Knoxville, $8,225.

**Supplies & Accounts (Navy)**

**Musgrave Pencil Co., Inc.,** Shelbyville, General writing & colored pencils, $37,700.
**Thompson-Katz Lumber Co.,** Memphis, First and seconds white ash, $20,943.

**Marine Corps (Navy)**

**Anderson-Tully Co.,** Memphis, Lumber, $1,938.

**Ordnance (Army)**

**Fulton Sylphon Co.,** Knoxville, Retainers for fuse, $7,373.
**Atlas Powder Co., Chattanooga Plant,** Ooltewah, Spotting charges, $823,363.

**Medical Corps (Army)**

**Slumber Products Corp.,** Memphis, Mattresses, $32,333.

## TEXAS

Value of Total Awards July 1, 1940 to March 15, 1941

| | |
|---|---|
| Army Contracts | $80,361,160 |
| Navy Contracts | 127,423,607 |
| U. S. Maritime Commission Emergency Ship Program | 4,680,000 |
| Federal Works Agency | |
| W. P. A. Defense Projects | 14,043,346 |
| U. S. H. A. Defense Housing Projects | 812,402 |
| Public Buildings Administration | 3,011,500 |

(*Continued on page* 66)

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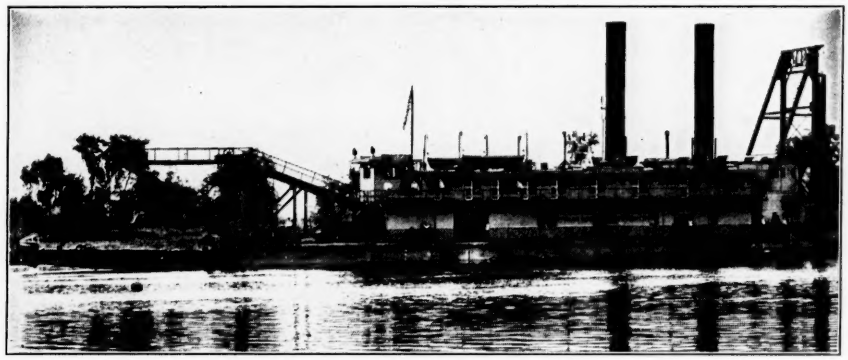

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## Fiberglas—A Servant of Industry

(*Continued from page* 23)

against heat, cold and noise. In ships it insulates the hull and refrigerated spaces and protects piping, boilers and turbines. Being glass, it does not support combustion, thereby contributing to fire safety at sea.

In national defense, fiberglas is filling certain vital needs in the construction of cantonments, naval and merchant ships and airplanes. By its use on a battleship, it can save enough weight on the ship to enable the vessel to carry additional fuel oil to give it six extra days away from its base. In the construction of the 110,000 new dwellings required for national defense, Fiberglas Red Top provides an insulation medium that offers a potential annual saving in fuel costs of $2,500,000.

One of the most interesting recent uses for Fiberglas material is as an insulating material in electrically-heated diving suits for deep sea divers. A short time ago, the United States Navy announced that it has made such suits standard equipment for all of its divers. This development was made necessary by the fact that helium-oxygen diving gas is now being used in diving. While it is much superior to compressed air, it makes the divers very cold and reduces their working efficiency. For that reason, it was necessary to heat the suits by electricity and fiberglas material was found to be the only completely safe insulating material to use in the suits.

Another potentially important use of the new fiberglas material is as an airplane fabric to cover the wings and fuselage. Recently, for the first time in the history of aviation, airplane wings covered with glass cloth were tested in actual flight. Test pilots and industrial engineers found the results of the first flight very satisfactory and predicted the widespread use of the new material for this purpose.

Unlike the other airplane fabrics, the new material does not shrink or stretch in the presence of moisture, does not rot, and it is unaffected by sunlight or temperature changes encountered in flying. As an airplane covering, fiberglas cloth is described as having an extremely high strength-weight ratio; that is, it is lighter and stronger than standard cotton cloths used for wing covering and it retains its light weight because it has a substantially lower moisture pickup.

As a result, it helps save weight that may be added to a plane flying through rain or fog. This advantage, it is claimed, is enhanced because the glass fibers of which the cloth is woven are non-absorbent, smooth and continuous. Consequently the glass fabric does not soak up impregnating materials, and the smaller amount of dope needed to give the fiberglas fabric a smooth surface weighs less than that required to treat absorbent materials like cotton or linen.

In addition to its many contributions to industry, fiberglas material has proven to have value in interior decoration. A variety of household fabrics—such as draperies, bed spreads and tablecloths—are being made of it.

* * *

And so, in the broad business panorama, the development of fiberglas has been an example of a new industry born of research during the depression years. This new material has already proven its value in many ways and there are almost limitless opportunities for its use in the future.

## Polystyrene A Manufacturers' Plastic

(*Continued from page* 33)

centrations of both acids and alkalies. It is insoluble in petroleum hydrocarbons; the lower aliphatic alcohols, such as ethanol and methanol; glycol ethers, and lactic acid esters.

Comprehensive tests of chemical-resistant properties have been made in the Research and Development Laboratories of Bakelite Corporation. Test pieces of the standard water-white material were totally immersed in various chemicals, including petroleum products, photographic, chemicals, and vegetable oils. In a solution of concentrated sulphuric acid the test piece became only slightly yellow after 33 months. In a solution of 5 per cent acetic acid there was no attack in 27 months. In a sodium chloride test the piece was unaffected after 55 hours continuous exposure to 20 per cent salt spray at room temperature. Immersed in a chrome plating bath there was no attack after 33 months.

Polystyrene has equally good resistance to alkalies and hydrofluoric acid. As these two chemicals attack glass, polystyrene containers are used for accurate analytical work which requires the use of these chemicals. It is probable that polystyrene will soon be used for a new-type packaging of hydrofluoric acid, in textile equipment, battery housings, and electroplating equipment. It is already being successfully used, for example, in closures on chlorine bleaching solution bottles.

The illustration (Figure 3) shows how polystyrene is employed for both decorative and utilitarian purposes in the refrigeration industry. All these parts are made of polystyrene because it does not become brittle or lose strength at temperatures as low as 30° C., resists vegetable and animal acids and remains unaffected by moisture. In fact, polystyrene is the most water-resistant of all organic plastics. Tested in carbonated water for 5 weeks at a temperature of 3° C., there was no change. The material, under further tests, has been found to absorb only .05 per cent water after 318 hours' immersion. This property, plus the natural corrosion resistance of the material, opens a large hitherto unexplored field for polystyrene as a replacement for heavier and less repellent substances.

## Construction Contracts Reach High for Year

(*Continued from page* 21)

Construction was under way at Freeport, Tex., on an $8,000,000 magnesium alloys plant to be operated by Dow Chemical Co., which recently finished a big plant at that Gulf Coast town for extracting magnesium from the Gulf of Mexico, and also operates a plant employing a similar operation to obtain bromine from the Atlantic Ocean at Wilmington, N. C.

The contract was let for preliminary work on a $3,000,000 fluorescent lamp plant to be established at Fairmont, W. Va., by Westinghouse Electric & Manufacturing Co. Tennessee Valley Authority proposed increasing the phosphate output of its plant at Muscle Shoals, Ala., by installation of a new furnace at a cost of $1,000,000. Stockholders of Southland Paper Mills, Inc., the South's only newsprint plant, approved a $2,400,000 expansion.

Capacity of the Navy Department's Macon, Ga., fuse loading plant, which represents an investment of $5,000,000 is to be doubled. The plant will be operated by the Reynolds interests now constructing the $17,000,000 aluminum plant and big fabricating unit at Sheffield, Ala. Tennnessee Products Corp., Chattanooga, Tenn., started work on a $1,800,000 addition and exercised an option to take over the Roan furnaces for making ferromanganese at Rockwood, Tenn. Aluminum Company of America announced contracts for its Alcoa, Tenn. plant, which with two hydroelectric projects in North Carolina and other expansion constitutes a $150,000,000 program.

Among the larger Federal projects were seven temporary buildings proposed at the Department of Agriculture farm in Arlington County, Virginia, cost $3,000,000; a temporary air corps cantonment at Baton Rouge, La., covered under a $1,441,340 contract; a $2,036,786 contract for work at Camp Claiborne, La.; a $1,900,000 army air base and pilot training field contract at Macon, Ga.; a $3,924,607 contract for additional troop housing at Camp Jackson, S. C.

Recently approved Naval public works bills provide for approximately $20,000,000 worth of naval and marine base construction in Virginia. The Army plans a $2,500,000 quartermaster depot at Alexandria, Va.; a $7,189,607 project for completing Brookley Field, southeastern air depot at Mobile, Ala. A $14,575,000 marine training base would be established in Onslow County, North Carolina, by the Navy Department.

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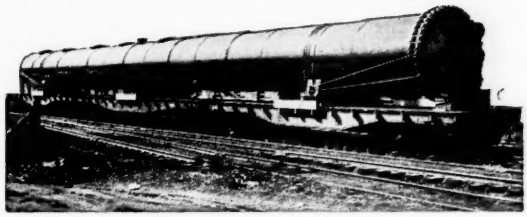

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XUM

# New Industrial Plants and Expansions in the South

(*Continued from page* 35)

about 2 miles, will be constructed by Brown & Root.

**HOUSTON**—steel mill—Sheffield Steel Corp., R. L. Gray, Pres., Kansas City, Mo. let contract to 3 steel fabricators to furnish material and erect 6 buildings in connection with construction of $17,000,000 plant on 593 acre site on north side of Houston Ship Channel near Irish Bend; contractors are Mosher Steel Co., 3910 Washington St., Alamo Iron Works, 2000 Taylor St. and Commercial Iron Works, 6422 Esperson St.; bids being received for clearing the site; soon call for bids for 20,900,000 cu. yds. of foundation work, expected to get underway in 30 days; plant will probably be completed and in operation by Jan. 1, 1942; will have 3 open hearths; will manufacture ingots, blooms, billets, etc.; Kenneth Franzheim, 2306 Crawford St., Houston, has been commissioned as architect and resident engineer; F. R. McFarland, engineer for Sheffield; initial installation of plant facilities here will cost approximately $12,000,000, an additional investment of from $3,000,000 to $5,000,000 for working capital; contracts for railroad spurs and a private road will be let at same time as foundation work; Sheffield Steel Corp. is a subsidiary of American Rolling Mill Co., Middletown, Ohio.

**ORANGE** — shipyard extension — Weaver Shipyards, Archie Weaver, Gen. Mgr., plans extension to shipyard; company has contract for building ten 135-ft. minesweepers for government at cost of $3,333,000; Commander E. B. Perry, in charge of navy shipbuilding at Orange.

## VIRGINIA

**ELKTON**—plant—C. M. Guest & Sons, Jefferson Bldg., Greensboro, N. C., has contract for erection of $500,000 plant on 312-acre site on Shenandoah River, 3 miles south of Elkton, for Merck & Co., Inc., Rahway, New Jersey; George P. Butler, Jr., 40 E. 49th St., Supervising Archt.; Lockwood Greene Engineers, Inc., Engrs., 10 Rockefeller Plaza, both New York.

**NARROWS**—extension—Celanese Corporation of America let contract to George Hazlewood, Cumberland, Md., for extension of plant; work includes additional chemical and textile buildings, yarn and supply warehouse and a new machinery building; cost of expansion, $1,500,000.

**NORFOLK** — acid plant — Smith-Douglass Co., Inc., Board of Trade Bldg., let contract to Chemical Construction Co., 30 Rockefeller Plaza, New York, for sulphuric acid plant with capacity for producing 30,000 tons a year, doubling present capacity; work to start at once; cost $250,000; sulphuric acid plant is part of the Smith-Douglass works at South Money Point.

## WEST VIRGINIA

**FAIRMONT** — fluorescent lamp plant — Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., let contract to Adam Eidemiller, Greensburg, Pa., for grading for fluorescent lamp plant; plans and specifications being prepared by construction department for general contract.

# Contracts Proposed

## ALABAMA

**MUSCLE SHOALS**—furnace, etc.—TVA, Knoxville, Tenn., will increase phosphate production by 50 per cent at Muscle Shoals; program will include installation of new furnace costing $1,000,000 and an increase in production from 100,000 to 150,000 tons annually.

## FLORIDA

**JACKSONVILLE** — shipyard — Jacksonville Shipbuilding Corp. filed papers of incorporation with Secretary of State, Tallahassee, to establish shipbuilding plant on 1300-acre site at Eastport; plan constructing 25 shipways and 200 buildings; estimated cost between $25,000,000 and $40,000,000; Grant B. Shipley, Koppers Bldg., Pittsburgh, Pa.; Walter A. Jones, Pittsburgh, Pa.; L. E. Detwiler and associates interested; John M. Rice, Grant Bldg., Pittsburgh, Pa., chief engineer for company.

## GEORGIA

**MACON**—fuse loading plant—Navy Department will double capacity of fuse loading plant, lately announced to cost $2,000,000, present cost placed at $5,000,000; plans as originally stated were for first unit, announcement now includes second unit; additions will provide for 80 buildings; fence 5 miles long will enclose the plant; will fuse more than 6000 shells daily; will be operated by Reynolds Corp., 200 Southern Bldg., Washington, D. C.; V. P. Loftis, Builders Bldg., Charlotte, N. C., has contract for first unit.

## KENTUCKY

Gas wells—Kentucky-West Virginia Gas Co., 231 S. La Salle St., Chicago, Ill., Peter C. Van Gilst, of Ashland, vice-president in charge of operations plans expenditure of $1,500,000 for development and operating 90 gas wells in eastern Kentucky, in Floyd, Knott and Pike counties; lately announced making survey for a 200-mile pipe line from Floyd county to northern West Virginia.

Expansion—Kentucky & West Virginia Power Co., M. C. Funk, V. P., Ashland, will expend approximately $4,339,000 in 1941 in eastern Kentucky for electric power expansion and installation; plan developments at Hazard, Pikeville and Ashland.

**ASHLAND**—blast furnace—American Rolling Mill Co., Middletown, Ohio, having $5,000,000 blast furnace designed by Arthur G. McKee Co.

## LOUISIANA

Gas oil distillate recovery plant—Texas Co., Magnolia Ave. and River Rd., Port Allen, applied for permit to operate an experimental gas-oil distillate recovery plant in Paradise field of St. Charles Parish; plant would process 5,000,000 cu. ft. of gas daily to recover an estimated 125 bbls. of fuel.

**NEW ORLEANS**—plant—Board of Commissioners of port of New Orleans completed preliminary arrangements for construction of a $1,125,000 industrial plant building on Industrial Canal to be leased to International Harvester Co.; part 1 and 2-stories warehouse and factory; 400x800 ft.; reinforced concrete and steel; soon call for bids.

**NEW ORLEANS** — pecan shelling plant — Southern Pecan Co., Jules Schaumburger, Pres., 516 Magazine St. receives bids about June 1 for shelled pecan plant; concrete floors; 30,000 square feet floor space; built-up roof; partly air conditioned; Leo S. Weil and Walter B. Moses, Consulting Engrs., 425 Magazine St.; cost of building $60,000, of equipment $20,000.

**SHREVEPORT**—expansion—Dow Chemical Co., Midland, Mich., reported, plans $8,000,000 expansion program; increase present output of 9000 tons of magnesium annually to 18,000 tons; work financed by Defense Plant Corp.

## MARYLAND

Airplane plant—Allied Aircraft Corp., has acquired from North American Aviation Corp., Inglewood, Calif., property at Turner's Station, Baltimore county, including brick and steel factory building; installing plant machinery for construction of airplanes for national defense program.

**BALTIMORE** — steel plant expansion — Rustless Iron & Steel Corp., 3400 E. Chase St., negotiating with Navy Dept. for emergency plant facilities contract under which $725,000 would be spent for installation of an additional 25-ton electric melting furnace and the construction of a new building in which will be centered the annealing and pickling department; proposed new furnace, if installed, will increase ingot melting capacity by approximately 30,000 tons of ingots per annum making the total capacity 120,000 tons of ingots per annum; preferred stockholders authorized company to borrow not in excess of $800,000 to finance installation of additional plant facilities.

## MISSISSIPPI

**HINTONVILLE**—tung oil extraction plant —G. L. Reasor, 135 S. LaSalle St., Chicago, Ill., plans construction of tung oil extraction plant at Hintonville, located on Gulf, Mobile & Ohio R. R., also fronting on Mississippi Highway No. 15; modern plant capable of handling 50 tons of tung nuts daily; estimated cost of plant, machinery and installation approximately $75,000; will probably be completed to care for 1941 crop.

## MISSOURI

**WELDON SPRING** — waste water plant — Weldon Spring Ordnance Works, Maj. Carl R. Dutton, Post Commander, will erect waste water disposal plant to remove all toxic materials remaining after process of manufacturing TNT has been completed; liquid will be piped from each of the six production lines to a central collecting station for treatment.

## NORTH CAROLINA

**HAZELWOOD** — factory — Dayton Rubber Manufacturing Co., Dayton, Ohio, receives bids March 19 in Dayton, for factory; Geyer & Neuffer, Archt., Dayton; Southeastern Construction Co., 218 W. 2nd St., Charlotte, estimating.

## OKLAHOMA

Recycling plant—Magnolia Petroleum Co., Magnolia Bldg., Dallas, Tex., a subsidiary of Socony-Vacuum, plans $1,000,000 recycling plant for development of its 9600 block of leases in Dewey County, northwestern Oklahoma, for gas-distillate.

**TULSA** — bomber assembly plant — City voted $750,000 bonds to meet federal requirements for location of $15,000,000 bomber assembly plant; bonds will be used for acquisition of necessary land, extension of water and sewer facilities, and construction of disposal plant; plant will be erected by Government and operated by Douglas Aircraft Co., Santa Monica, Calif.; Manhattan Construction Co. of Muskogee, and Long Construction Co., Philtower Bldg., Tulsa, will construct main building which will be 4000 ft. long, 325 ft. wide with 200 ft. of paving on each side; office; boiler house; maintenance shop; paint shop and hangar; on site to include runways, etc., covering approximately 1000 acres.

## SOUTH CAROLINA

**GREENWOOD**—expansion—Matthews Cotton Mill of South Greenwood granted a certificate of necessity to expand its plant by National Defense Commission.

## TENNESSEE

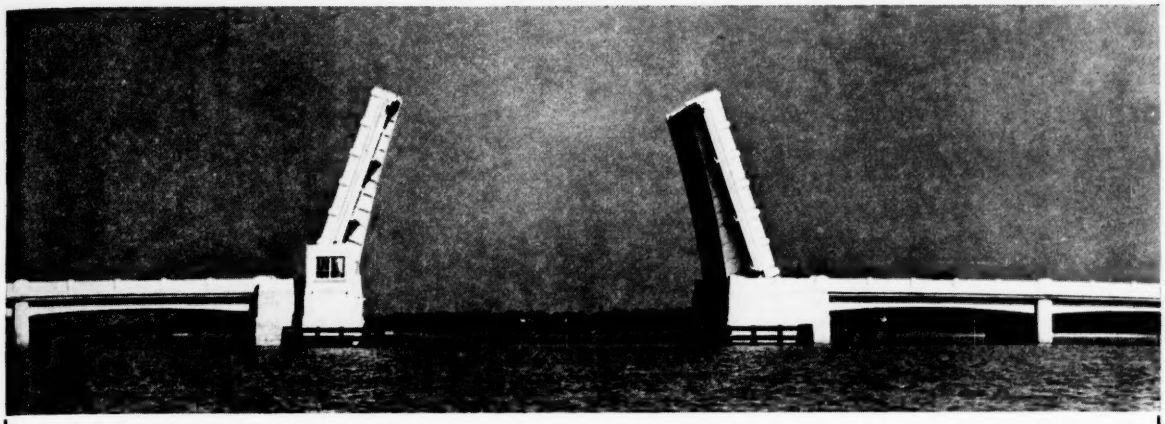
Pipe line—Standard Oil Co. of New Jersey, 26 Broadway, Shell Union Oil Co., 65 Broadway, both New York, Standard Oil Co. of Kentucky, Louisville, Ky. and Plantation Pipe Line Co., reported, considering construction of $17,000,000 gasoline pipeline project, 1261 miles long, extending from Baton Rouge, La. to Greensboro, N. C.; specifications as now drawn, would provide for line to draw off 48,000 bbls. of gasoline daily jointly from Standard Oil Co. of Louisiana refinery at Baton Rouge and Shell Oil Co.'s refinery at Norco; this would be carried consecutively through 436 miles of 11-in. steel pipe, 359 miles of 9-in. pipe, 252 miles of 4-in. and 210 miles of 6-in.; use 14 pumping stations; fuel would be carried to Meridan, Miss.; Moundsville; Birmingham, Montgomery and Oxford, Ala.; Chattanooga and Knoxville, Tenn., and intermediate points.

**CHATTANOOGA** — expansion — Columbian Iron Works, 2501 Chestnut St. plans $188,000 expansion program; install additional equipment for production of shells; recently leased old plant of Star Box & Printing Co.; plans certified by National Defense Commission.

**MEMPHIS**—remodeling plant—R. H. Bogle Co., Alexandria, Va., acquired property on Mallory, convert buildings into plant for manufacture of alkali chlorates; will expend approximately $200,000.

**MEMPHIS**—munitions plant—Jesse Jones, Federal Loan Administrator, has announced that Defense Plant Corp. a subsidiary of RFC, at request of War Dept. and with approval of the President, is arranging to buy several munitions plants, construction of which has

(*Continued on page* 60)



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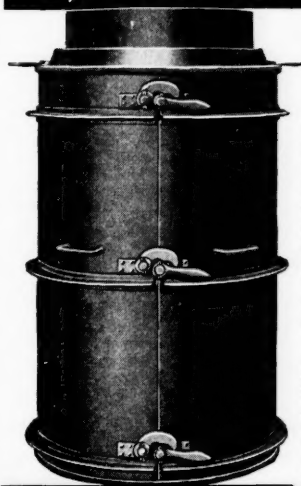

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XUM

## New Industrial Plants

(*Continued from page 58*)

been financed by British Government; these include a powder plant near Memphis, which has been constructed for the British by Dupont, at total cost of approximately $25,000,000, and 4 machine gun plants, aggregating approximately $21,000,000 as follows: Buffalo Arms Corp., Buffalo, New York, Colt's Patent Fire Arms Manufacturing Co., Hartford, Conn., Kelsey-Hayes Wheel Co., Plymouth, Mich. and High Standard Manufacturing Co., New Haven, Conn.

**MEMPHIS**—airplane parts plant—Fisher body division of General Motors Corp., Detroit, Mich., plans converting facilities of Fisher Body plant at Memphis to manufacture of airplane parts and subassemblies; parts to be manufactured are for use in connection with recently announced General Motors-North American Aviation, Inc. program for production of twin engine medium bombers.

**ROCKFORD** — iron works — Tennessee Products Corp., American National Bank Bldg., Nashville, acquired properties of Roane Iron & Coal Co., at Rockwood; property includes 14,000 acres of land containing coal and iron ore seams and 2 blast furnaces; ferro-manganese, an alloy used in purification of steel will be principal product of plant.

### TEXAS

**BEAUMONT** — shipyard — Pennsylvania Shipyards, Inc., acquired whole of the industrial island in Neches river at Beaumont; later may move part of Petroleum Iron Works Co.'s operations to Port Arthur; Pennsylvania Shipyards, Inc. is building 2 cargo vessels for U. S. Maritime Commission at cost of $2,000,000 each.

**FORT WORTH**—bomber plant—City voted $2,500,000 bonds for establishment of bomber plant by War Department to be operated by Consolidated Aircraft Corp., San Diego, Calif.; cost $10,000,000.

**HOUSTON**—rail spur—Sheffield Steel Corp., of Texas, receives bids March 31 for construction of 9600 ft. of railroad track to serve proposed $17,000,000 steel mill on Ship Channel; spur will be constructed from one of the main lines of the Port Terminal R. R.

**LUFKIN**—paper mill expansion—Southland Paper Mills, Inc., authorized plans for expansion in mill, including enlargement of pulp mill, with installation of a complete new production unit for large increased pulp capacity for news print manufacture; also will carry out extensions in groundwood mill for corresponding increase in raw material supply, with installation of new grinders and auxiliary equipment; entire project, reported to cost about $2,400,000; to provide necessary financing, board of directors will make application to RFC for a loan of about $1,500,000, and will dispose of a stock issue totaling approximately $900,000; it is understood that plans for new addition will be prepared by George F. Hardy, 305 Broadway, New York, consulting engineer; following completion of this expansion, it is proposed within the next 18 to 24 months, to increase capacity of paper-making division at mill.

**TEXAS CITY**—lubricating oil unit—Consolidated Oil Corp., plans construction of lubricating oil unit, estimated to cost several million dollars.

**WACO** — bottle factory — Owens-Illinois Glass Co., Toledo, Ohio, acquired site near Waco, for erection of a glass container plant and plant for a bottle factory.

### VIRGINIA

**ALTAVISTA**—mining—Otter River Mining Co., Inc., G. C. Menzing, Pres. plans erection of a beneficiating plant to refine manganese ore in Campbell County.

**NEW CASTLE**—manganese development—R. W. Arms of Evanston, Ill., consulting engineer for American Zinc, Lead & Smelting Co., St. Louis, Mo. will be president of company to be formed to develop manganese deposits in Paint Bank section of Craig County; will probably operate as Blue Ridge Manganese Corp.

**RICHMOND**—extension—Philip Morris & Co., Ltd., Inc., 10 S. 20th St., announced new financing of $14,899,100 for purpose of rebuilding old United States Tobacco Co.'s plant, to increase cigarette output and to improve the company's bank loan position; will also construct a half block long shipping and storage warehouse.

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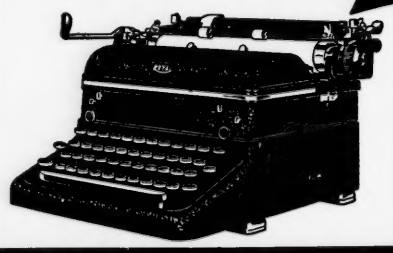

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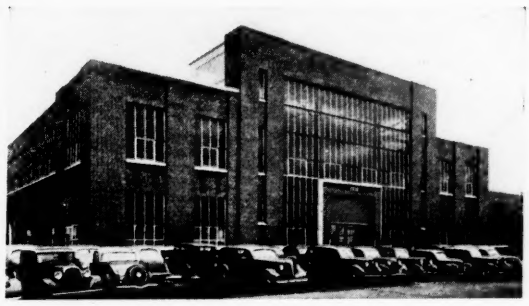

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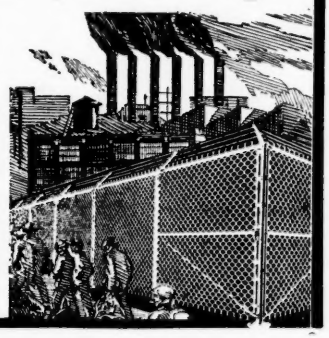

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## Inventory Financing Through Field Warehousing

(*Continued from page* 36)

bill-of-lading as evidence of the fact that the goods have gone to an actual purchaser. This document will shortly be replaced by a trade acceptance from the purchaser, or an assignment of this account by the manufacturer to the bank. Or, as the finished goods are withdrawn, they may be replaced in the warehouse with freshly manufactured goods of an equivalent value. In either instance, raw materials or finished goods, the bank always has a tangible lot of goods as collateral for its loan. Moreover, these goods are segregated from the borrower's other assets; are of ascertainable value, are kept in prime condition; and are marketable without reference to the state of the borrower's other affairs. This makes the loan entirely liquid, since as the goods concerned are finally absorbed into consumption, the inflowing cash pays off the bank loan first of all.

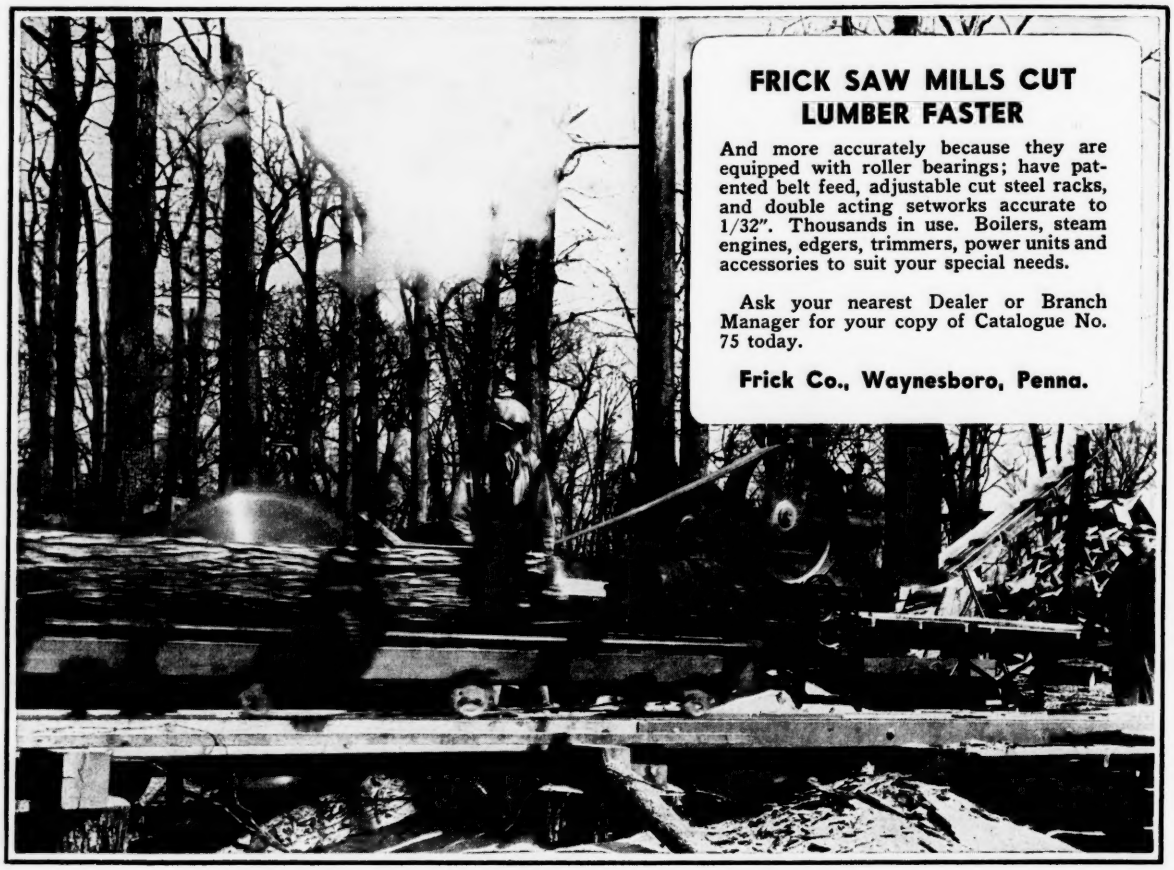
In the last analysis, field warehousing is nothing more than the extension of the process of public warehousing. The warehouse goes to the product instead of the product to the warehouse.

The cost of field warehousing is only a small part of the cost of storage in other types of public warehouses for the following reasons: 1. The costs of two handlings are avoided. There is no handling into and out of the public merchandise warehouse as the goods remain on the storer's premises. 2. Cost of transportation between point of production and a public warehouse is avoided. 3. Damage to containers as a result of transportation and rehandling is avoided. 4. Lost time and lost motion with the resultant expense to the storer is avoided. 5. Field Warehousing charges are calculated on a lower basis because investment in building, equipment, etc, has already been made by the storer and does not, therefore, fall upon the shoulders of the field warehouseman.

As the use of field warehousing has become better understood by bankers, they have been suggesting to prospective borrowers, even those who have previously found their unsecured notes acceptable, that they segregate whatever raw materials and finished goods they have available as security for loans. Public warehouse services in financing the distribution of goods have always been important. Today these services are not only being made use of by the distributors of goods, but also by manufacturers and processors through the use of field warehouses, without reference to distribution but solely as a means of strengthening their credit positions. Also many manufacturers make use of field warehousing when raw material prices are rising and they are anxious to cover their future requirements but are unable to obtain additional financing through regular channels.

The use of field warehouses is generally limited to manufacturers, with an average inventory of at least between $30,000 and $50,000. It would not pay to set up a field warehouse for a smaller volume. The principle, however, is sound in creating the most acceptable type of collateral for loans and permits a manufacturer or other producer to obtain the use of warehouse receipts for financing purposes, almost always at a lower cost than he would obtain the same financial service by placing goods in other types of warehouses.

There are seven simple steps to organizing every field warehouse operation. These are: 1. The warehouse company leases the property to be used for storage from the owner. 2. Signs are prominently posted stating that the property is a public warehouse. 3. Control of the stored products is assured by locks so that no unauthorized person can have access to the inventory. 4. A warehouse agent (custodian) is appointed by the warehouse company after careful investigation as to his fitness. 5. The warehouse agent( custodian) is bonded for the protection of the borrower, the warehouse company, and the bank loaning on the warehouse receipts. 6. Detailed instructions are given the custodian by the warehouse company with regard to his specific duties in the care of the inventory —the bank's collateral. 7. The warehouse company issues its non-negotiable warehouse receipts covering the inventory.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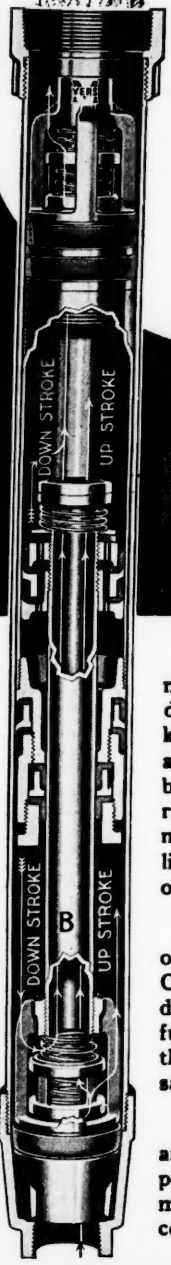


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XUM

## Newport News Meets Housing Demands

(*Continued from page* 37)

and the Cind-R-Bloc back-up, allowing for drainage between them. All main partition walls also are built with Cind-R-Bloc.

The one-story duplex houses have the same foundation and concrete floor slab construction, but are of typical brick veneer above with expressed roofs covered with asbestos shingles.

Windows are of metal casement type, treated to prevent corrosion and furnished with screens and shades. The ceilings in the two-story houses are not plastered, and the paint will be applied directly on the underside of the slab.

For decorative effect two colors of brick have been employed on two of the projects, using special coursing along the lines of the windows to break an otherwise plain surface. On the other project a striking effect has been attained by making designs with a four inch Cind-R-Bloc in the face of the buildings and around the doorways. This work has been accomplished at little or no additional cost.

Of especial interest is the contract time on the three projects and the progress being made in spite of adverse employment conditions. Harbor Homes, the original slum clearance project of 252 dwelling units with an office and community building is based on a 150-day contract. The contractor is the Woodcrest Construction Company, Inc., and Rosoff Brothers, Inc., of New York and Baltimore. Marshall Courts is also on a 150-day contract, the contractor being the V. P. Loftis Company of Charlotte, N. C. Orcutt Homes is on a 130-day schedule; Woodcrest and Rosoff Bros. have this contract also.

Williams, Coile and Pipino of Newport News are the architects for all these projects and with them are associated Thos. Nichols, Mechanical Engineer, and Pierre Ghent Associates, Landscape Engineers. Chairman of the local Housing Authority is Thos. J. Hundley, and the commissioners are Sam Hickey, David Dick, Mrs. Kritzer, and Leroy Ridley.

## Florida's Invitation to Industry

(*Continued from page* 40)

be sold in the market at profitable prices. But the state's production of vegetables throughout the year, and at low cost, can be increased to meet almost any reasonable exigency of the canning industry. The canning of sea foods, such as fish, shrimp, clams, turtle, lobster and even oysters, can be developed into a major industry. Shipments of such products outside the state for canning is obviously impracticable. With the improvements which have been made in canning methods, a substantial and continuing increase in demand for such products may be predicted.

The commercially important by-products of fisheries have been woefully neglected in Florida. For example, the nonedible menhaden is used in the manufacture of fish oil and fertilizer; and crushed and prepared oyster shells are used for road building and poultry foods.

The cattle industry in Florida is rapidly expanding, and has become an important source of income throughout the state. In a few years meat packing and related businesses such as the tanning of leather and the production of leather goods, should be of importance.

Florida has a monopoly in the United States on the production of alligator hides. Few of these are processed or manufactured into finished commodities in Florida. No good reason can be suggested why this industry should not be carried on within the state.

Much of the fertilizer now used in Florida is bought from out of state plants, which in turn use Florida phosphate in the manufacture of that fertilizer. A fertilizer industry, based on Florida phosphate, should be able profitably to serve Florida and perhaps a part of the southeast.

Industrial research is opening up many new vistas. Existing deposits of clay, sands and minerals might be utilized for the manufacture of china ware, pottery, containers, insulators, glass, filters and construction materials. Ramie, an agricultural product which grows abundantly in Florida, and has high textile strength, might be found commercially profitable. And similarly, a commercial use might be found for the common palmetto. As early as the time of the Spaniards, Florida's moss was used for cushions and horse collars. Wider and more varied uses may be found for this product as well as for the hyacinth, both of which are found in profusion in the state. The saw-grass of the Everglades is a possible source of cellulose, and the composition of the peat of that same area suggests that its commercial uses may be considerable.

Florida's transportation facilities are, in most respects, satisfactory. The state has over 5,000 miles of steam railroads, more than 15,000 miles of surfaced roads, more than 12,000 miles of coast, and airways servicing all of its important cities. The problem is not facilities but cost, particularly of railroad transportation. Seasonal activity and low traffic density are the two factors contributing most significantly to this cost. As the industrial and agricultural products of the state increase in volume, cost may be expected materially to decrease. Inland waterways, as well as the ocean routes, have been used far less than they profitably could be used both for intra state and out of state consignments. In view of investigations already made, the desirability of re-adjustment of Florida railroad freight rates will, it is hoped, be apparent to the Interstate Commerce Commission. In any event the state's facilities, particularly its waterways and ports are good, especially in relation to trade with certain of the South American countries.


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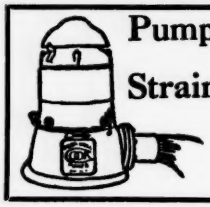
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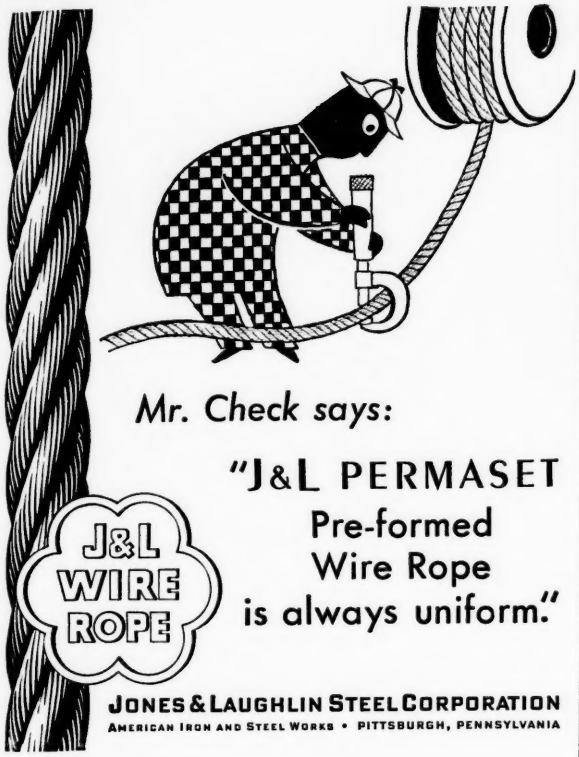

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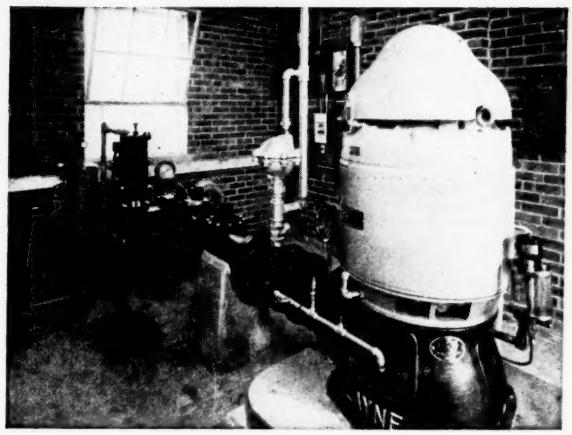

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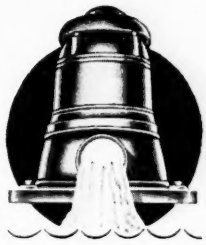

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# National Defense Program Awards

(*Continued from page 54*)

## TEXAS (Continued)

| | |
|---|---|
| **Federal Security Agency** | |
| **Office of Education Defense Training** | **1,665,787** |
| **Federal Loan Agency** | |
| **Defense Plant Corporation** | **15,707,407** |
| **Reconstruction Finance Corporation** | **15,500,000** |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Finesilver Manufacturing Co.**, San Antonio, 25,000 khaki cotton trousers, $17,500.
**Great Western Garment Co.**, Wichita Falls, 25,000 khaki cotton trousers, $17,500.
**H. W. Zweig Manufacturing Co.**, Dallas, 50,000 khaki cotton trousers, $35,456.
**Hicks-Hayward Company**, El Paso, 40,000 khaki cotton trousers, $27,572.
**The Hawk & Buck Company, Inc.**, Waco, 50,000 khaki cotton trousers, $35,411.
**Williamson-Dickie Mfg. Co.**, Fort Worth, 200,000 khaki cotton trousers, $139,650.
**Pool Manufacturing Co.**, Sherman, 35,000 khaki cotton trousers, $24,813.
**Sunshine Clothing Mfg. Co.**, San Antonio, 50,000 khaki cotton trousers, $33,660.
**H. W. Zweig Manufacturing Co.**, Dallas, 50,000 khaki cotton trousers, $35,456.
**Lion Brand Manufacturing Co.**, Dallas, 60,000 khaki cotton trousers, $41,400.
**Crawford-Austin Mfg. Co.**, Waco, pyramidal tents, $225,400.
**Fort Worth Tarrant Co. Association for the Blind**, Fort Worth, 5,000 bleached cotton pillowcases, $1,075.
**Dallas Association for the Blind**, Dallas, 6,620 bleached cotton pillowcases, $1,423.
**San Antonio Association for the Blind**, San Antonio, 1,500 bleached cotton pillowcases, $3,225.

**Supplies & Accounts (Navy)**

**Cameron Manufacturing Co.**, Dallas, typewriter ribbons, $12,726.

## VIRGINIA

**Value of Total Awards July 1, 1940 to March 15, 1941**

| | |
|---|---|
| **Army Contracts** | **$104,803,568** |
| **Navy Contracts** | **738,867,473** |
| **Federal Works Agency** | |
| **W. P. A. Defense Projects** | **3,744,431** |
| **U. S. H. A. Defense Housing Projects** | **4,996,323** |
| **Public Buildings Administration** | **1,702,000** |
| **Federal Security Agency** | |
| **Office of Education Defense Training** | **589,676** |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**Lynchburg Hosiery Mills**, Lynchburg, 500,000 prs. woolen socks, $122,634.
**Harwood Mfg. Corp.**, Marian, 144,000 drawers, cotton shorts, $42,697.
**Craddock-Terry Shoe Corp.**, Lynchburg, 75,000 prs. service shoes, $251,250.

**Ordnance (Army)**

**Norfolk Bagging Co.**, Norfolk, gunny sacks, $2,217.
**Triton Chemical Corp.**, Glen Wilton, explosive ($175,000 arbitrarily apportioned between Virginia and New Jersey, $87,500.
**Hercules Powder Co., Inc.**, Hopewell, cellulose and mixed acid, $67,700.

**Corps of Engineers (Army)**

**Superior Bag & Burlap Co.**, Norfolk, sand bags, $60,774.

**Chemical Warfare (Army)**

**The O'Sullivan Rubber Co.**, Winchester, outlet valves, $11,000.
**The O'Sullivan Rubber Co.**, Winchester, outlet valves, $74,000.

**Supplies & Accounts (Navy)**

**Taylor-Parker Co., Inc.**, Norfolk, milling machine cutters and saws, $28,227.
**Smith-Douglass Co., Inc.**, Norfolk, sulphuric acid, $11,007.
**Virginia Machinery & Well Co., Inc.**, Richmond, composition valves, $16,522.
**Bristol Aircraft Corp.**, Bristol, life floats, $193,322.
**The Old Dominion Paper Co.**, Norfolk, paper clips and erasers, $17,101.
**Priest Lumber Co., Inc.**, Norfolk, Southern Pine, No. 1 dimension, lumber, $5,610.
**M. T. Blassingham & Co., Inc.**, Norfolk, No. 1 dimension lumber, $54,870.

## WEST VIRGINIA

**Value of Total Awards July 1, 1940 to March 15, 1941**

| | |
|---|---|
| **Army Contracts** | **$27,297,555** |
| **Navy Contracts** | **51,563,221** |
| **Federal Works Agency** | |
| **W. P. A. Defense Projects** | **285,082** |
| **Federal Security Agency** | |
| **Office of Education Defense Training** | **714,192** |
| **Federal Loan Agency** | |
| **Reconstruction Finance Corporation** | **38,590** |

**CONTRACTS AWARDED FEBRUARY 16 TO MARCH 15**

**Quartermaster Corps (Army)**

**The Washington Manufacturing Co.**, Huntington, 75,000 khaki cotton trousers, $51,724.
**J. L. Stifel & Sons, Inc.**, Wheeling, 3,000,000 yds. herringbone twill cotton cloth, $847,200.

**Ordnance (Army)**

**Ames Baldwin Wyoming Co.**, Parkersburg, shovels, $1,797.
**Barium Reduction Corp.**, South Charleston, chemical, $200,599.
**Follansbee Steel Corp.**, Follansbee, plate sheets, $5,967.

**Supplies & Accounts (Navy)**

**J. L. Stifel & Sons, Inc.**, Wheeling, cotton drill, $26,580.
**The Anchor Lumber Co.**, Parkersburg, domestic white oak, $130,840.
**Eagle Mfg. Co.**, Wellsburg, steel fillers and oilers, $16,548.

**Signal Corps (Army)**

**American Fork & Hoe Co.**, Charleston, axes, $1,136.

## United States Steel Display at American Mining Congress

With a group of six spaces reserved, United States Steel Corporation subsidiaries will present a joint exhibit to display their products at the American Mining Congress exposition to be held in Music Hall, Cincinnati, Ohio, April 28 to May 2. The exhibit will include a display of electrical wires and cables which demonstrates how corona losses may be eliminated by a new conducting rubber protection now available for mine use, while another will illustrate how wire rope life is prolonged or seriously impaired by correct or improper operating conditions. Section of wire rope taken from installations to show the effect of various conditions found in the field will be demonstrated. Other features will include samples of various tubular steel products used in the mining industry, among which will be Duroline cement lined pipe, rail bonds and other electrical and track accessories. Examples will be shown of the use of high tensile steels for reducing weight or increasing strength of mine cars, cages, skips and hoists, with samples and test pieces taken from operating installations. Cooperating in the exhibit will be American Bridge Company, American Steel and Wire Company, Carnegie-Illinois Steel Corporation, National Tube Company, Scully Steel Products Company and Tennessee Coal, Iron and Railroad Company, all subsidiaries of United States Steel Corporation. A new type of lounge area will be provided for the comfort of visitors.

## Johns-Manville Atlanta Office

To meet an increasing demand in the South for industrial products, Johns-Manville, New York City, is establishing an industrial sales office at Atlanta, Ga., under the direction of Thomas J. Roberts, who has been with the company since 1925. Announcement of the opening of the new office was made by Lewis H. Brown, president.

## Northern Equipment Appointment

The Northern Equipment Company, Erie, Pa., manufacturers of the COPES System of Boiler Feed Control, announce the appointment of Henry G. Carter, 5505 Branch Avenue, Tampa, Fla., as district representative for COPES feed water regulators, differential valves, pump governors, and allied equipment.

**DANGERS OF FIRE GASES—**
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**Portland Cement Association,** Chicago, Ill.

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Booklet—8 pages, illustrating and describing a new Hendrick screen for sizing and dewatering which is said to be the only one with two distinct actions—shaking and whipping; publication presents details of construction and operation, with particular emphasis on exclusive Hendrick features.
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**Westinghouse Electric and Manufacturing Company,** East Pittsburgh, Pa.


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